

Stage II Detailed Site Investigation

26-42 Eden Street, Arncliffe NSW

Prepared for: Arncliffe Eden Property Pty Ltd

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Abbreviations

ADE	ADE Consulting Group Pty Ltd
ACM	Asbestos Containing Material
ASS	Acid Sulfate Soil
BGL	Below Ground Level
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
CoC	Chain of custody
CoPC	Contaminants of Potential Concern
CSM	Conceptual Site Model
CT	Contaminant Threshold
DBYD	Dial Before You Dig
DEC	Department of Environment & Conservation
DP	Deposited Plan
DPIE	Department of Planning, Industry and Environment
DLWC	Department of Land and Water Conservation
DSI	Detailed Site Investigation
DSZ	Deep Soil Zone
ENM	Excavated Natural Material
EPA	Environment Protection Agency
GSW	General Solid Waste
HEPA	Heads of EPAs Australia and New Zealand
HILs	Health Investigation Levels
HMS	Hazardous Materials Survey
HSLs	Health Screening Levels
LAA	Licensed Asbestos Assessor
LEP	Local Environment Plan
LEP	Local Environmental Plan
LGA	Local Government Area
NATA	National Association of Testing Authorities
NDD	Non-destructive digging
NEPC	National Environmental Protection Council
NEPM	National Environmental Protection Measure
NEMP	National Environmental Management Plan
NSW	New South Wales
OCPs	Organochlorine Pesticides
OEH	Office of Environment & Heritage
OPPs	Organophosphorus Pesticides
PAHs	Polycyclic Aromatic Hydrocarbons
PASS	Potential Acid Sulfate Soil
PFAS	Per- and Poly-fluoroalkyl substances
PSI	Preliminary Site Investigation
PCBs	Polychlorinated Biphenyls
PVC	Poly-vinyl Chloride
RAP	Remedial Action Plan
RSW	Restricted Solid Waste
SAC	Site Assessment Criteria
SCC	Specific Contaminant Concentration
SMF	Synthetic Mineral Fibre
SH&EWMS	Safety, Health & Environmental Work Method Statement
TCLP	Toxicity Leaching Procedure
TRHs	Total Recoverable Hydrocarbons
UCL	Upper Confidence Level
UFP	Unexpected Finds Protocol

Executive Summary

ADE Consulting Group Pty Ltd (ADE) was engaged by Arncliffe Eden Property Pty Ltd to undertake a Stage II Detailed Site Investigation (DSI) at 26-42 Eden Street, Arncliffe, New South Wales (NSW) (hereafter referred to as the 'Site').

The Site comprises an approximate area of 1.361 hectares (ha) and is located within the Local Government Area (LGA) of Bayside Council. The Site is currently listed as B4 – Mixed Use and is legally defined as DP 447649 (Lot 1), DP 23701 (Lots 1, 2, 3, 7, 8, 9, 10, 11 and 12), DP 1094906 (Lot 3) and DP 1228031 (Lots 25 and 26).

The purpose of this Phase II DSI is to assess the Site with regards to the contaminants of potential concern (CoPC) which were identified during the previous DSI conducted by Coffey Services Australia Pty Ltd in 2018 (Coffey 2018a) and Stage I Preliminary Site Investigation (PSI) conducted by Reditus Consulting in 2019 (Reditus, 2019). To achieve this, the scope of work assigned to this investigation broadly involved the following:

- Completion of a desktop review of previous investigations and known information sources;
- Completing a detailed soil investigation for the identified CoPCs outlined within the Stage I PSI (Reditus, 2019) and Stage II DSI (Coffey, 2018a);
- Submission of all samples to National Association of Testing Authorities, Australia (NATA) accredited laboratories; and
- Preparation of a Stage II DSI report outlining the investigations methodology, interpretation of the results, conclusions and recommendations concerning contamination impacting both environmental and human health within the Site.

Following a review of the desktop study and known information sources, the PSI identified several possible sources of contamination including but not limited to; asbestos, synthetic mineral fibres (SMF), lead paint, pesticide use and fill material. The Stage II DSI provided further information regarding a preliminary site investigation stating approximately half of the fill material was classified as Restricted Solid Waste (RSW) due to lead exceedances. However, following toxicity leaching characteristic potential (TCLP) testing, the preliminary waste classification was reduced to General Solid Waste. The area surrounding BH20 was classified as Restricted Solid Waste due to a benzo(a)pyrene exceedance.

To determine the current contamination status of the soil on Site, ADE developed an intrusive sampling investigation which was designed and developed in accordance with relevant environmental legislation and guidelines. The sampling investigation was undertaken on the 30th of November and 1st of December 2020, in which a total of 22 borehole locations were completed across the Site.

A total of 44 primary soil samples (excluding QA/QC) were collected throughout the course of the investigation and submitted to NATA accredited laboratories for analysis. Following analysis, all primary soil samples returned concentrations below that of the adopted human health and ecological site assessment criteria as referenced in the *National Environmental Protection Measure [NEPM], 2013 Amendment* (NEPC, 2013).

Due to the sampling methodology using a drill rig consisting of a direct push tube, a quantitative assessment for asbestos in soil was unable to be undertaken and is therefore considered necessary in the event the soil materials are proposed to be retained or beneficially re-used within the Site boundaries.

Furthermore, for the purposes of providing a preliminary waste classification, all concentrations within the fill materials were below that of the Absolute Maximum and Average Maximum Criteria for Excavated Natural Material as prescribed in the ENM Order 2014 (NSW EPA, 2014a) with the following exceptions.

Elevated concentrations of Lead exceed the Absolute Maximum criteria in samples:

- DSI-BH04 (0.2)

- DSI-BH09 (0.3-0.4)
- DSI-BH11 (0.3-0.4)
- DSI-BH14 (0.5-0.6)
- DSI-BH15 (0.2-0.3)
- DSI-BH18 (0.2-0.5)
- DSI-BH22 (0.2-0.4)

Elevated concentrations of Benzo(a)pyrene exceed the Absolute Maximum criteria in the sample:

- DSI-BH20 (0.2-0.4)

These samples were found to meet the Contaminant Threshold (CT) 1, TCLP1 and Specific Contaminant Concentration (SCC) 1 criteria of General Solid Waste, as prescribed by the NSW EPA Waste Classification Guidelines - Part 1: Classifying Waste (2014) (NSW EPA, 2014b), with the exception of sample DSI-BH20 (0.2-0.4) which met the CT2 criteria of Restricted Solid Waste due to the presence of Benzo(a)pyrene. In addition, all virgin soil materials collected across the course of the investigation were below the adopted background soil ranges and met the definition of Virgin Excavated Natural Material as defined under the Protection of the Environment Act 1997 (POEO Act, 1997).

Following a review of the analytical results and the absence of any exceedances against the adopted SAC, ADE considers that the landowner does not have a duty to report contamination to the NSW EPA regarding the chemical characteristics of the in-situ soils, however in the event that the soils are to be re-used onsite further investigation will be required to determine the suitability of the soils with regards to asbestos. Based on the above conclusions, ADE recommends that the following recommendations are completed to ensure the Site remains suitable for the proposed development and the most beneficial waste classification is achieved:

- Completion of an intrusive hazardous materials survey of all structures subject to demolition with all identified hazardous materials recorded and maintained on an up-to-date register and subsequently removed by a SafeWork Licenced Asbestos Assessor and / or appropriately licensed removalist prior to any demolition activities;
- Care should be taken when conducting a waste classification surrounding BH20 and PAH TCLP analysis should be included within the suite of analytes;
- Development of a construction environmental management plan (CEMP) to ensure the proposed construction works will be managed to avoid or mitigate potential environmental or nuisance impacts. The CEMP should include but not be limited to environmental controls, vibration and acoustics, site and emergency contact information, corrective action policies, procedural review standards and the development of an UFP; and
- Following demolition, further in situ sampling of the site in accordance with the sampling design guidelines as stated in NSW EPA 1995 and referenced in the NSW ENM order of 2014 with the inclusion of pH, EC and NSW RTA T276 Foreign materials analysis with the delineation sampling surrounding the sample points as listed above.

Taking into consideration the data obtained from both previous and current investigations, ADE considers that the Site can be made suitable for the proposed development, with no requirement for a Stage III Remediation Action Plan (RAP).

1 Introduction

1.1 Background and General Information

ADE was engaged by Arncliffe Eden Property Pty Ltd to undertake a Stage II DSI located at 26-42 Eden Street, Arncliffe, New South Wales (NSW) (refer to *Appendix I – Figures*).

The Stage II DSI was designed to assess the site regarding CoPCs identified during the DSI conducted by Coffey Services Australia Pty Ltd in 2018 (Coffey 2018a) and Stage I Preliminary Site Investigation (PSI) conducted by Reditus Consulting in 2019 (Reditus, 2019). The investigation also sought to determine if the Site is suitable for the proposed development with regards to the State Environmental Planning Policy No 55 — Remediation of Land (SEPP No. 55). A review and summary of all previous investigation reports and documentation can be referred to in Section 3.

The purpose of this DSI is to assess the nature and extent of potential contamination within soil at the Site. This was undertaken through:

- Completion of a desktop review of previous investigations and known information sources;
- Completion of a detailed soil investigation;
- Submission of all samples to NATA accredited laboratories; and
- Preparation of a Stage II DSI report outlining the investigations methodology, interpretation of the results, to make conclusions and recommendations concerning contamination impacting both environmental and human health within the Site.

The Site investigation and corresponding sampling regime was undertaken on the 30th of November and 1st of December 2020, which involved the collection and subsequent analysis of collected samples. The selected samples were compared against the adopted Site Assessment Criteria (SAC) outlined within Section 7, in order to determine if the Site is suitable for the proposed land use.

1.2 Proposed Development

Based on information provided to ADE by the Client, the proposed development will involve the construction of four (4) new residential towers with retail properties on the ground floor. In addition, 4000 m² of public park will be developed centrally within the site. A basement carpark will be built underneath the majority of the site except a small portion to the west of the site. Preliminary development application site plans provided by the client can be found in *Appendix VIII – Preliminary Development Application Site Plans*.

1.3 Objectives

The primary objective of this investigation is to characterise the vertical and lateral extent of soil contamination (if present) within the Site. The objectives of the investigation were achieved by:

- Summarising any past and present potentially contaminating activities through a desktop study supported by information obtained from the Stage I PSI (Reditus, 2019);
- Assess the contamination status of the Site, which may have been impacted by past / present land use and/or off-site contamination from the surrounding area;
- Completion of an intrusive investigation program developed in accordance with the NSW Environment Protection Authority (EPA) 1995 *Sampling Design Guidelines* (NSW EPA, 1995) and National Environment Protection (Assessment of Site Contamination) Measure 1999, 2013 Amendment (NEPC 2013);
- Assessing and describing the source, type, extent and level of contamination by comparing the collected soil data against the adopted SAC outlined in guidelines including, but not limited to, NEPM

(NPEC, 2013), PFAS National Environmental Management Plan v2.0 (NEMP, 2020) and other relevant guidelines, as outlined throughout this report;

- Determine the potential risks posed to human health and environment (if present); and
- Provide an assessment of the Site and develop recommendations for remedial works or ongoing management based on the findings (if required).

1.4 Scope of Work

The Scope of work for the Investigation involved the following:

1.4.1 Phase One – Desktop Review

- Desktop review of the Site plans, previous environmental investigations, selected aerial photographs, title records, NSW EPA public registers and Council planning records/ certificates; and
- Obtain and review ‘Dial Before You Dig’ (DBYD) documentation.

1.4.2 Phase Two – Field Investigation

- Understanding and sign on to a job specific of a Safety, Health & Environmental Work Method Statement (SH&EWMS) and the completion of a toolbox talk prior to undertaking works;
- Completion of 22 boreholes using a GeoProbe drill rig with a direct push tube attachment and a hand auger where applicable;
- Field logging of soil profile and Site observations;
- Soil sampling of the topsoil, subsoil, fill and natural materials;
- Field screening of collected samples for Volatile Organic Compounds (VOCs) using a calibrated Photoionisation Detector (PID);
- Cold storage of all soil samples collected; and
- Analysis of samples for the following analytes based on the findings outlined in the Stage I PSI (Reditus, 2019) and previous Stage II DSI (Coffey 2018a):
 - Asbestos (Presence / Absence), BTEX, Heavy Metals (Arsenic, Cadmium Chromium, Copper, Lead, Mercury, Nickel and Zinc), Toxicity Characterization Leaching Procedure (TCLP) - Heavy Metals Organochlorine / Organophosphorus Pesticides (OCPs / OPPs), Polycyclic Aromatic Hydrocarbons (PAHs), Polychlorinated biphenyl (PCB), Recoverable Hydrocarbons (TRHs) and PFAS.

1.4.3 Phase Three – Analytical Test Work

Submission of samples to NATA accredited laboratories for analysis under Chain of Custody (CoC) documentation.

1.4.4 Phase Four – Data Assessment and Conclusions

- Interpretation of analytical results and field observations in accordance with relevant guidelines and codes of conduct described below in Section 1.5; and
- Preparation of a Stage II DSI report outlining the investigation, interpretation of results, and including conclusions and recommendations with reference to the proposed development.

1.5 Guidelines and Codes of Practice

The legislative framework for the report is based on guidelines that have been issued and/or endorsed by the NSW Environmental Protection Authority (EPA), formerly the Office of Environment and Heritage (OEH) under the following Acts/Regulations:

- Contaminated Land Management Act 1997;

- Environmental Planning and Assessment Act 1979;
- Protection of the Environment Operations Act 1997; and
- State Environmental Planning Policy (SEPP) 55 'Remediation of Land'.

The relevant guidelines issued under the provisions of the aforementioned Acts/Regulations include:

- Guidance for the Preparation of Standard Operating Procedures for Quality-Related Documents (EPA QA/G-6);
- Guidance on Data Quality Indicators, EPA QA/G-5I; and
- Guidelines for the NSW Site Auditor Scheme (3rd Edition), NSW 2017;
- Guidelines on the Duty to Report Contamination (2015) under the Contaminated Land Management Act 1997;
- Guidance for the Data Quality Objectives Process (EPA QA/G-4);
- Guidance for Data Quality Assessment: Practical Methods for Data Analysis (EPA QA/G-9);
- National Functional Guidelines for Inorganic Data Review, USEPA, (1994);
- NSW EPA Contaminated Sites: Sampling Design Guidelines (NSW EPA 1995);
- National Environmental Protection Council [NEPC]. (2013). National Environmental Protection Measure 1999, 2013 Amendment (NEPC, 2013);
- New South Wales Environmental Protection Agency [NSW EPA]. (2020). Consultants reporting on contaminated land - Contaminated Land Guidelines (NSW EPA, 2020); and
- The Heads of EPAs Australia and New Zealand [HEPA]. (2020). PFAS National Environmental Management Plan Version 2.0, dated January 2020 (HEPA, 2020).

Australian Standards applied to this investigation:

- Australian Standard AS 4482.2 Guide to the sampling and investigation of potentially contaminated soil. Part 2: Volatile substances, (Standards Australia, 1999);
- Standards Australia Australian Standard AS4964-2004: Method for the qualitative identification of asbestos in bulk samples (Standards Australia, 2004); and
- Australian Standard AS 4482.1 Guide to the sampling and investigation of potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds, (Standards Australia, 2005).

The following local government plans have also been taken into consideration for preparation of this DSI:

- Botany Bay Local Environmental Plan 2013.

1.6 Project Background

This Stage II Detailed Site Investigation (DSI) is submitted to the Department of Planning, Industry and Environment (DPIE) in support of a State Significant Development Application (SSDA-11429726) for the development of land identified at 26-42 Eden Street and 161-179 Princes Highway, Arncliffe (the site) for the purposes of a mixed-use precinct with open space, retail, and residential uses, comprising social and market housing as part of the NSW Land and Housing Corporation (LAHC)'s 'Communities Plus' program.

SSDA-11429726 seeks approval for the following development:

- Demolition of all existing buildings and structures on the site;
- Site preparation works, excavation and tree removal;
- The construction of a mixed-use development comprising:
 - 744 apartments across (4) buildings between 19-23 storeys in height, as follows:
 - 186 market housing apartments in Building A;
 - 202 market housing apartments in Building B;
 - 180 social housing apartments in Building C; and

- 176 market housing apartments in Building D;
- 3,113m² retail gross floor area;
- 240m² for a future childcare centre;
- 3,706m² of communal open space;
- 813 spaces of lower ground and basement car parking; and
- 4,870m² of publicly accessible open space including a 4,000m² park; an 870m² public plaza (meeting space) and through site link connecting Eden Street and the Princes Highway.

In accordance with section 4.39 of the Environmental Planning & Assessment Act 1979 (EP&A Act), the Secretary’s Environmental Assessment Requirements (SEARs) for SSDA-11429726 were issued on 18 December, 2020. This report has been prepared to respond to the following SEARs:

SEAR	(Relevant Item) and section of report
13. Contamination	<p>(a) preliminary investigation assessing and quantifying – see section 3.1.2 .</p> <p>(b1) Soil Testing. See section 9.3</p> <p>(b2) Groundwater Testing. See section 10.2</p> <p>(c) Site Suitability for Intended Use. See section 11.3</p> <p>(d) Detailed Site Investigation (DSI). ADE (2021) and Coffey Services (2018a) have conducted DSI works at the site.</p> <p>(e) Remedial Action Plan (RAP). See section 11.3</p> <p>(f) LTEMP. A LTEMP is not required at this time.</p>
16. Ground Conditions	<p>(a) Geotechnical. See the separate Geotechnical Investigation report.</p> <p>(b) Acid Sulfate Soil Impacts. See section 4. Multiple lines of evidence all support that ASS are considered unlikely to be present at the site.</p>

2 Site Identification and Details

2.1 Site Location

The Site is located at 26-42 Eden Street, Arncliffe NSW 2205 and comprises an area of 1.361 ha or 13,610 m². The Site is situated within the LGA of Bayside Council and is zoned B4 – Mixed Used. The Site is legally defined as Deposited Plan (DP) 447649 (Lot 1), DP 23701 (Lots 1, 2, 3, 7, 8, 9, 10, 11 and 12), DP 1094906 (Lot 3) and DP 1228031 (Lots 25 and 26).

The Site is owned by the NSW Land and Housing Corporation who are proposing to redevelop the site in partnership with Arncliffe Eden Property P/L into a mixed-use high density precinct that includes approximately 180 contemporary social housing dwellings. The location of the Site is defined below in Figure 1 and provided in *Appendix I - Aerial Figures*.



Figure 1. Site Identification (image adapted from *Nearmap*; accessed on 16.12.2020).

2.2 Summary of Site Details

Table 1. Summary of Site Identification Details.

Site Details	
Site Address	26-42 Eden Street, Arncliffe NSW
Title Identification	(DP) 447649 (Lot 1), DP 23701 (Lots 1, 2, 3, 7, 8, 9, 10, 11 and 12), DP 1094906 (Lot 3) and DP 1228031 (Lots 25 and 26)
LGA	Bayside Council
Current Land Use Zoning	B4 – Mixed Used
Site Area	Approximately 13,610 m ²
Site Coordinates	151148041 E 151148041 N
Current Site Owner / Occupier	NSW Land and Housing Corporation
Former Land Use	General Residential
Current Land Use	General Residential
Local Environmental Plan	Botany Bay Local Environmental Plan 2013
Approximate Elevation	Approximately 20-24 m above Australian Height Datum (AHD)

3 Site History

3.1 Previous Investigation Reports

3.1.1 Coffey Services Australia Pty Ltd (2018b). Asbestos and Hazardous Materials Limited Pre-Demolition Survey - 26-42 Eden Street, Arncliffe NSW. Issue No. 1, dated 21st November 2018.

Coffey Services Australia Pty Ltd (hereafter referred to as Coffey) was commissioned by NSW Land and Housing Corporation to undertake an Asbestos and Hazardous Materials Pre-Demolition Survey for the 26-42 Eden Street, Arncliffe NSW.

The following represents a summary of the findings identified by the survey:

- Suspected asbestos fibre cement sheeting was observed in the following locations:
 - Blocks 1-14, exterior, eaves throughout;
 - Block 5, interior, stairwell, window sill, debris; and
 - Block 6, exterior, south-east elevation, on ground, debris.
- Suspected asbestos containing bituminous material was observed in the following locations:
 - Block 2-4, interior, cupboard beneath stairs, electrical backing board;
 - Block 7, unit 19, kitchen, beneath vinyl sheet and tile, floor coverings brown (third layer), adhesive; and
 - Block 7, unit 19, kitchen, beneath vinyl sheet, tile and sheet, floor coverings white (bottom layer), adhesive.
- Suspected asbestos containing paper backing was observed in the following locations:
 - Block 6, unit 13, kitchen, below grey vinyl floor tiles, floor coverings green.
- Suspected Synthetic Mineral Fibres (SMF) materials were identified in the following locations:
 - Block 1-14, exterior, inside walls, throughout, pipe work, external insulation;
 - Block 2 and 4, exterior, eastern elevation, hot water heater, internal insulation;
 - Block 4, unit 134 and 135, kitchen, riser, pipe work, internal insulation;
 - Block 10, exterior, northern elevation, hot water heater, internal insulation;
 - Block 10, unit 91, bathroom, ceiling space, pillow insulation; and
 - Block 11 and 12, exterior, southern elevation, hot water heater, internal insulation.
- Lead containing dust was detected in the following locations:
 - Block 1, unit 68, bathroom, riser – 1400 mg/kg lead containing dust; and
 - Block 1, unit 72, ceiling space – 1200 mg/kg lead containing dust.
- Lead based paint was detected in the following locations:
 - Block 1, exterior, entrance, façade – 0.38% w/w lead containing cream paint topcoat
 - Block 1, exterior, entrance, façade – 0.38% w/w lead containing cream paint topcoat;
 - Block 1, unit 61, kitchen, walls – 0.25% w/w lead containing green paint topcoat;
 - Block 1, unit 61, throughout, walls – 0.17% w/w lead containing beige paint topcoat;
 - Block 1, unit 61, bathroom, walls – 0.33% w/w lead containing white paint topcoat;
 - Block 1, unit 63, throughout timberwork – 0.16% w/w lead containing white paint topcoat;
 - Block 1, unit 66, throughout, walls – 0.30% w/w lead containing beige paint topcoat;
 - Block 2, exterior, throughout timberwork – 2.3% w/w lead containing white paint topcoat;
 - Block 3, exterior, throughout down pipes and gutters – assumed lead containing green paint topcoat;
 - Block 4, exterior, throughout downpipes and gutters – 0.27% w/w lead containing green paint topcoat;
 - Block 4, exterior, entrance, façade – 0.13% w/w lead containing cream paint topcoat;
 - Block 5, exterior, throughout timberwork – 2.4% w/w lead containing white paint topcoat;
 - Block 5, unit 60, bedrooms, walls – 0.12% w/w lead containing light blue paint topcoat;
 - Block 6, exterior, throughout timberwork – 0.32% w/w lead containing white paint topcoat;
 - Block 6, unit 13, throughout ceiling – 0.25% w/w lead containing beige paint topcoat;
 - Block 6, unit 15, throughout walls – 0.17% w/w lead containing light green paint undercoat;
 - Block 7, exterior, throughout timberwork – 5.3% w/w lead containing white paint topcoat;
 - Block 7, exterior, entrance, façade – 0.28% w/w lead containing cream paint topcoat;

- Block 8, exterior, throughout timberwork – 1.2% w/w lead containing white paint topcoat;
- Block 8, exterior, entrance, façade – 0.22% w/w lead containing cream paint topcoat;
- Block 9, exterior, entrance, façade – 0.91% w/w lead containing cream paint topcoat;
- Block 10, exterior, entrance, façade – 0.34% w/w lead containing cream paint topcoat;
- Block 11, exterior, entrance, façade – assumed lead containing cream paint topcoat;
- Block 11, unit 26, throughout walls – 0.14% w/w lead containing cream paint topcoat;
- Block 12, unit 85, throughout walls – 0.22% w/w lead containing cream paint topcoat;
- Block 13, exterior, throughout timberwork – 2.3% w/w lead containing white paint topcoat;
- Block 13, exterior, flower box rails, metal work – 1.3% w/w lead containing brown paint topcoat;
- Block 13, exterior, entrance, façade – 0.34% w/w lead containing cream paint topcoat; and
- Block 13, unit 31, throughout timberwork – 0.19% w/w lead containing brown paint topcoat.
- PCB containing capacitors were suspected in the following locations:
 - Block 1, unit 65, kitchen, fluorescent light fittings;
 - Block 2, exterior, throughout, fluorescent light fittings;
 - Block 3, interior, electrical cupboards, fluorescent light fittings;
 - Block 4, interior, electrical cupboards, fluorescent light fittings;
 - Block 5, unit 59, kitchen and bathroom, fluorescent light fittings;
 - Block 6, unit 8, kitchen, fluorescent light fittings;
 - Block 6, unit 12, bathroom, fluorescent light fittings;
 - Block 10, exterior, stairwell, fluorescent light fittings;
 - Block 11, exterior, stairwell and southern elevation, fluorescent light fittings;
 - Block 12, exterior, stairwell and southern elevation, fluorescent light;
 - Block 13, exterior, throughout, fluorescent light fittings; and
 - Block 13, unit 31, bathroom, fluorescent light fittings.
- No Ozone Depleting Substances were identified or suspected to be present at the time of survey.

Based on the findings of the survey the following conclusions / recommendations regarding asbestos were reached;

- Removal works must be undertaken by an appropriately licensed asbestos contractor;
- If removal works are conducted within or adjacent to a highly sensitive area, an asbestos hygienist independent of the asbestos removal contractor should undertake asbestos fibre monitoring along the boundary of the works;
- If friable asbestos is identified, a licensed asbestos assessor must be engaged to:
 - Inspect the asbestos removal work area prior to commencement of the works;
 - Undertake asbestos fibre air monitoring during removal and clearance works;
 - Complete a visual inspection of the removal area immediately surrounding it and ensure the area is free from visible asbestos contamination; and
 - Provide a Clearance Certificate documenting the asbestos has been removed to a satisfactory standard.
- During future demolition works, if any materials that are not referenced in the report and are suspected of containing asbestos are encountered, then works must cease and an asbestos hygienist should be notified to determine whether the material contains asbestos.

Coffey (2018b) provided the following recommendations regarding SMF:

- If the SMF is un-bonded or deteriorated, in a poor/unstable condition and accessible with risk to health from exposure, immediate access restrictions should be applied, and removal is required as soon as practicable;
- Access should be restricted if removal is not immediately practicable; and
- Prior to any demolition, partial demolition, renovation, or refurbishment where synthetic mineral fibre materials are likely to be disturbed should be removed in accordance with the *NOHSC Code of Practice for the Safe Use of Synthetic Mineral Fibres* [NOHSC:2006 (1990)].

Coffey (2018b) provided the following recommendations regarding lead containing dust:

- Confirmed lead-containing dust within the riser and ceiling space should be removed prior to demolition works in accordance with Australian Standard (AS4361.2), *Guide to Hazardous Paint Management – 2017 Part 2: Residential and commercial buildings*;
- Activities that involve disturbance of dust within the riser and ceiling space should be undertaken with caution in accordance with Australian Standard (AS4361.2), *Guide to Hazardous Paint Management – 2017 Part 2: Residential and commercial buildings*;
- Any work processes involving lead-containing dust must be undertaken in a manner to ensure that no worker is exposed to lead at concentrations above occupational exposure standard (OES) of 0.15 mg/m³ over an eight-hour day. Furthermore, the levels should not exceed 0.03 mg/m³ at the boundary of the regulated area, i.e. boundary of area surrounding a lead removal worksite, where it can be reasonably expected not to exceed the OES; and
- Lead-containing dust removal works should include the use of High Efficiency Particulate Air (HEPA) filtered vacuum cleaners and wet wiping techniques by a licensed contractor under controlled lead-containing dust conditions.

Coffey (2018b) provided the following recommendations regarding SMF:

- If the SMF is un-bonded or deteriorated, in a poor/unstable condition and accessible with risk to health from exposure, immediate access restrictions should be applied and removal is required as soon as practicable;
- If removal is not immediately practicable, access should be restricted; and
- Prior to any demolition, partial demolition, renovation or refurbishment, synthetic mineral fibre materials likely to be disturbed by those works should be removed in accordance with the NOHSC Code of Practice for the Safe Use of Synthetic Mineral Fibres [NOHSC:2006 (1990)].

Coffey (2018b) provided the following recommendations regarding lead-based paint:

- Prior to any future demolition, partial demolition, renovation or refurbishment where lead-based paint is likely to be disturbed, the lead based paint should be removed in accordance with the Australian Standard (AS4361.2), *Guide to Hazardous Paint Management – 2017 Part 2: Residential and commercial buildings*.

Coffey (2018b) provided the following recommendations regarding Polychlorinated Biphenyls (Capacitors Only):

- All metal capacitors should be treated as containing PCB unless determined otherwise;
- The fluorescent light fittings should be removed prior to any future demolition, partial demolition, renovation or refurbishment in accordance with Department of Occupational Health, Safety and Welfare, Safe Handling of PCB in Fluorescent Light Capacitors – 1993 and with the Polychlorinated Biphenyls; and
- Post removal, provision should be made for appropriate storage/disposal of PCB containing capacitors.

3.1.2 Reditus Consulting. (2019). Stage I Preliminary Site Investigation - 26-42 Eden Street, Arncliffe NSW. Report No. 19206RP01, dated 26th November 2016.

Reditus Consulting was commissioned by Billbergia Pty Ltd to undertake a Stage I PSI to assess the potential for contamination to exist at 26-42 Eden Street, Arncliffe NSW. The primary objectives of the investigation were to identify past and present potentially contaminating activities; identify potential sources of contamination and types of contaminants, discuss the current site condition, provide a preliminary assessment of the Site contamination and to assess whether any further investigations are required.

The following represents a summary of the desktop review conducted during the investigation;

- A review of historical aerial photography for the Site suggested the following;
 - The Site was mostly vacant with a few small buildings until the 1950s;
 - Several high density residential dwellings were constructed during the 1950s;
 - The Site has remained largely unchanged since the 1950s; and
 - In 2002, an off ramp from the M5 east was constructed approximately 200 m north of site.
- A total of eight (8) listings were identified during a historical / trade data search, however no listings were directly related to the Site. Furthermore, following a review of the concept design plans the potential for direct / indirect exposure to impacted mediums is considered to be *low* and *unlikely*; and
- One (1) heritage item, Arncliffe Railway station was identified 77 m north-west of the site.

The following represents a summary of the site contamination investigation conducted during the investigation;

- There was no evidence of oil and chemical storage on the site, however, the site is located within an underground petroleum storage system (UPSS) sensitive zone;
- There is no evidence of historical or current industrial and manufacturing processes;
- As the buildings present on site were constructed prior to the 1960s, there is a potential for the presence of fibre cement (containing asbestos), polychlorinated biphenyls (PCBs) within electrical capacitors, leaded paint and/or synthetic mineral fibre (SMF) insulation within construction materials;
- Based on site photographs, it is unlikely that large quantities of imported fill have been brought onto site; and
- No information for the block regarding discharges to land, water and air was available for review at the time of writing the report; and
- Based on the results of the historical review and observations made during the site walkover, besides minor volumes of soil contamination associated with uncontrolled fill, fibre containing asbestos and pesticide use Reditus considers there to be no significant contamination sources identified on the site.

Based on the finds of the Stage I PSI the following recommendations / conclusions are listed:

- The site has no history of industrial (manufacturing) use and accordingly does not have a high potential risk for extensive soil, groundwater or soil vapour contamination;
- There were no visual signs of contamination or significant fill material being present onsite; and
- Fibre cement building products and material painted with leaded paint should be removed in accordance with appropriate hazardous material guidelines prior to the demolition of the building.

3.1.3 Coffey Services Australia Pty Ltd (2018a). *Detailed Site Investigation – 26-42 Eden Street, Arncliffe NSW*. Report No. 754-SYDEN216138-R01 dated 23rd September 2018.

Coffey was engaged by NSW Land and Housing Corporation to undertake a Stage II DSI at 26-42 Eden Street, Arncliffe NSW. The investigation was undertaken on the 18th and 26th of June 2018. Based on the findings of the Stage II DSI, the following represent a summary of conclusions / recommendations that were reached:

- Suspected asbestos containing material (ACM) fragments in a bonded form were identified at various surface soil locations across the site with a potential for additional asbestos to be uncovered within the subsurface fill material during demolition and redevelopment which may pose a potential health risk to construction workers or people on neighbouring properties;
- If significant asbestos is identified following demolition, this may alter the waste classification of the fill material present at the site and

- A preliminary waste classification assessment was carried on the samples collected with approximately half of the fill material samples classifying as General Solid Waste due to lead exceedances.

4 Site Condition and Surrounding Environment

The following table represents a summary of the site condition and surrounding environment as outlined within the Stage I PSI conducted for the Site (Reditus, 2019) and from observations made during ADE's field investigation.

Table 2. Summary of Site Condition and Surrounding Environment.

Attribute	Description
Site Inspection Details	The Site inspection was undertaken on the 22 nd of November 2019 by a Principal Environmental Scientist representing Reditus.
Topography and Elevation	The Site site is relatively flat with a slope of 5° from south to north with an elevation in between 20 – 24 m Australian Height Datum (AHD).
Surrounding Land Use	Based on the desktop search and Site observations conducted during the Stage I PSI (Reditus, 2019), the surrounding land uses are as follows: <ul style="list-style-type: none"> • North: Eden Street, followed by high density residential buildings and Arncliffe train station, followed by an off-ramp from the M5 east; • East: Princes Highway, followed by commercial buildings and multi-storey residential developments. • West: Eden St, followed by high density residential buildings and then railway tracks; and • South: Low density residential buildings with a small commercial block on the corner of Eden Street and Forest Road and St Francis Xavier's Catholic Primary School lies immediately south of Forest Road.
Surface Cover and Conditions	The site is covered with a mixture of hardstand and paved areas which include, pedestrian walkways and onsite parking. The landscaped areas between the blocks are covered with short grasses with the occasional bare patch.
Local Geology	The Site is located within the Gymea (9130gy) Soil Landscape as defined by the NSW Office of Environment and Heritage eSpade GIS tool. The Gymea soil landscape occurs extensively throughout the Hornsby Plateau and along the foreshores of Sydney Harbour and the Parramatta and Georges Rivers on Hawksbury Sandstone. <p>Although influenced by topography, the following dominant soil types are known to occur within the Gymea Soil Landscape;</p> <ul style="list-style-type: none"> • Loose, coarse sandy loam (gy1) - occurs as topsoil or the A horizon, the soil profile starts at a brownish-black which lightens to a bleached dull yellow-orange with depth. It is often water repellent under native vegetation. The pH ranges from 4 to 6 pH units. Small sandstone and platy ironstone fragments, charcoal fragments and roots are common. • Earthy, yellowish-brown clayey sand (gy2) – commonly occurs as subsoil over sandstone bedrock (B horizon) and contains apedal massive structure and porous earth. Texture may increase to a light sandy clay loam with depth. The pH ranges from 4 to 6.5 pH units. Sandstone and ironstone fragments are common and are often concentrated in stone lines in the upper parts of this material. Charcoal fragments are common whilst roots are rare. • Earthy to weakly pedal, yellowish-brown sandy clay loam (gy3) – usually occurs as subsoil (B or C horizon) on coarse sandstone. Texture increases from a sandy clay loam to a sandy clay with depth. Orange mottles may occur with

depth. The pH ranges from 4.5 to 6.0 with depth. Strongly weathered sandstone fragments are common. Roots and charcoal fragments are rare.

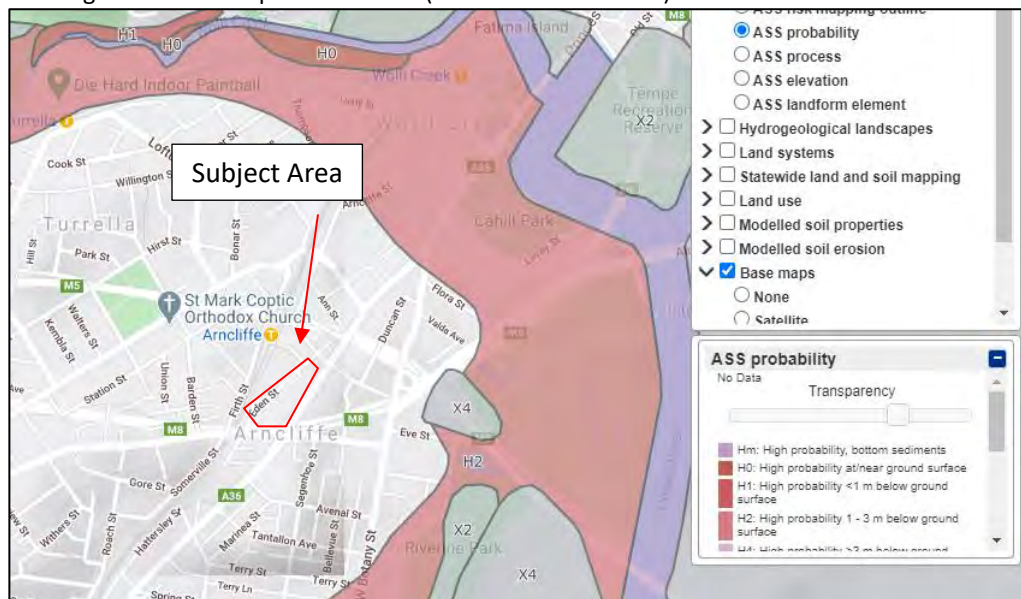
- Moderately to strongly pedal, yellowish-brown clay (gy4) – occurs as a subsoil on shale bedrock and is a yellowish-brown clay or light clay with moderately to strongly pedal structure. The pH ranges from 4 to 6. Shale and ironstone fragments are often present, but charcoal fragments are absent and roots are rare.

Hydrology The nearest surface water receptor or wetland is Eve Street Wetlands located approximately 500 m east of the site. The closest freshwater river system is the Cooks River which is located approximately 1 km east of the Site.

Hydrogeology/ Groundwater A review of NSW Department of Primary Industries Office of Water records for groundwater bores within a 1,000m radius of the site indicated the presence of 44 bores of which 10 are domestic bores, 26 monitoring bores, 2 industrial/irrigation bores, 4 water supply bores, and 2 recreation bores.

The site gently slopes from the south east corner to the north west corner. Based on the topography of the site and standing water levels of bores constructed by ADE’s geotechnical team, groundwater sits between 2 and 5 m below ground level.

Acid Sulfate Soils Coffey (2018b) determined that the Atlas of Australian Acid Sulfate Soils (ASS), compiled by CSIRO, revealed that the site is located in an area of extremely low probability for ASS soils. Additionally, a search on eSPADE (DPIE, 2020) revealed there is no data/No Known Occurrence with regards to acid sulphate soils risk (refer to Screenshot 1).



As the site is located at an elevation of between 20m AHD and 28 m AHD and given the proposed redevelopment containing limited basement carparks, ASS are considered unlikely to be present at the site.

5 Data Quality Objectives

The DSI works were designed using Data Quality Objectives (DQO) as defined by the US EPA, the NSW EPA in the *Guidelines for the NSW DEC Site Auditor Scheme* (2017, 3rd Edition), and Australian Standard AS 4482.1 (2005). The DQO process consists of a seven-step planning approach to facilitate the development of qualitative and quantitative statements that specify the quality of the data required to support decision making within the scope of the investigation. This process utilises systematic planning and statistical hypothesis testing to differentiate between two or more clearly defined alternatives.

5.1 Step 1 – State the Problem

The objective is to determine the nature and extent of contamination at the Site in order to assess if the Site is suitable (or can be made suitable) for the proposed development which involves the construction of new residential towers with retail commercial properties on the ground floor, an underground basement carpark, and a public park.

5.2 Step 2 – Identify the Decision

Based on a review of previous environmental investigations undertaken at the Site, the following decisions need to be made to allow for the Site to be made suitable for proposed development for mixed land use (i.e., residential / commercial).

- Are concentrations of the CoPC in excess of the relevant Tier 1 Site Assessment Criteria (SAC) as outlined in the Schedule B1 NEPM (2013) and contaminant thresholds outlined in *NSW EPA Waste Classification Guidelines - Part 1: Classifying Waste* (NSW EPA, 2014)?
- Have the investigative works been undertaken in accordance with the NSW EPA Guidelines for Consultants Reporting on Contaminated Sites (2020) and NSW EPA Sampling Design Guidelines (1995)?

Is the remediation of soil required to render the Site suitable for the proposed land use?

5.3 Step 3 – Identify Inputs to the Decision

To address the decision questions outlined in Step 2 of the DQOs, the following inputs to the decision have been identified:

- A review of the proposed development works;
- A review of previous environmental investigations undertaken at the Site;
- A review of the historical and current use of the Site;
- A review of the geological profile of the Site;
- Investigation of the current soil and groundwater conditions at the Site; and
- Comparison with the Site assessment criteria as outlined in Section 7.

5.4 Step 4 – Definite Boundaries of the Study

This step provides a detailed description of the spatial and temporal boundaries of the study area, characteristics that define the area of interest and any practical considerations for the study area. These are included in Table 3 below.

Table 3. Summary of the Study Boundaries

Spatial Boundaries	The geographical boundaries of the Site are outlined in <i>Appendix I – Figures</i> .
	The vertical boundaries of the investigation works were limited to 2 m BGL due to shallow depths of natural material across the site.
Temporal Boundaries	The investigation works were undertaken on the 30 th of November and 1 st of December 2020.
Investigation Limit	The limit of the investigation extent was defined by recommendations provided in the Preliminary Site Investigation (Reditus, 2019).
Constraints	The investigation was limited to the areas of the Site which were accessible at the time of the inspection i.e., areas which could not be accessed with the drill rig due to underlying services and / or within close proximity aged care residents.
	Time, cost, and construction activities occurring within the Site at the time of the field works.

5.5 Step 5 – Develop a Decision Rule

The purpose of this step is to define the parameters of interest, specify the action level and combine the outputs of the previous DQO steps into an “if...then...” decision rule that defines the conditions that would cause the decision maker to choose alternative actions.

The types of data quality required during the fieldwork, the laboratory components of the investigation and the acceptable limits for this data are specified in Table 4 below. A summary of the decision rules is included in the table.

Table 4. Summary of the Decision Rules.

Decision Rules	Based on the data quality types and limits the following decision rules applied:
	<ul style="list-style-type: none"> • If CoPCs are detected in the Rinsate blanks, then the field decontamination process may not have been adequate and cross contamination may potentially have occurred. Before assuming that this was the case, the project Environmental Scientist will check the Rinsate blank result with the testing laboratory and compare the result with a check blank sample which used the same source of water. It is possible that detections in Rinsate blanks may reflect background concentrations in laboratory-supplied water or analytical error. If it is concluded that decontamination procedures were inadequate, the project Environmental Scientist will assess the implications of the cross contamination and subsequent influence on the ability to resolve the decision question. Possible actions included the raising of working detection limits or the collection of replacement data; • If the Relative Percent Difference (RPD) values for blind replicates or split samples are outside the acceptable limits, then there may have been errors in a laboratory analysis process. When assessing duplicate pairs with elevated RPD values, the project Environmental Scientist will check the results with the laboratories and examine the nature of the sample being assessed, since heterogeneous samples can often provide high RPD values. If it is believed that irreversible errors had occurred during the laboratory process, then additional investigation may be deemed to be required to resolve the decision question; • Should greater than 5% of the laboratory QA / QC data fail to meet the acceptable limits outlined in this report, the laboratory may be requested to re-analyse samples or provide justification for the analytical results; • For the analysis of investigation samples, if the absolute value of the measured concentration of a parameter or compound are above the nominated SAC; and were deemed suitable for 95% UCL (Upper Confidence Limit) analysis, then the subject material can be deemed suitable to remain on-Site; and • 95% UCL data will only be considered where the standard deviation of the data set is less than 50% of the SAC, and the maximum concentration is less than 250% of the SAC. Samples exceeding these criteria will be excluded from the dataset and treated as a hotspot.

5.6 Step 6 – Specify Acceptable Limits on Decision Errors

This step is to establish the specific limits on decision errors, which were used to determine the targets for limiting uncertainty in the data. Data generated during the validation works needs to be appropriate to allow decisions to be made with confidence.

The specific limits for this project were based on appropriate guidance from the NSW EPA, NEPC (2013), AS4482.1 2005 and appropriate indicators of DQIs used to assess QA/QC for field sampling and handling.

To assess the suitability of the analytical data obtained during the prior to making decisions, the data was assessed against pre-determined Data Quality Indicators (DQIs) to assess precision, accuracy, representativeness, comparability, and completeness (PARCC parameters), as outlined in AS4482.1 2005. The acceptable limit on decision error was 95% compliance with the DQIs.

The pre-determined DQIs specified for the validation works are discussed below in relation to the PARCC parameters are summarised in Table 5.

Table 5. Summary of Acceptable Limits on Decision Errors.

Precision	<ul style="list-style-type: none"> • Sampling and analysis of field blind duplicates and split replicates to be undertaken at a minimum rate of one (1) per every ten (20) samples. • Laboratory duplicate analysis to be undertaken by the testing laboratory at a minimum rate of one (1) per twenty (20) samples. • Field and laboratory RPD values to be less than 30% for analytical results greater than (>) 30 times the laboratory LOR, less than (<) 50 % for analytical results between 10 and 30 times the laboratory LOR and a control limit of \pm the LOR if either the sample or duplicate value is less than 10 times the laboratory LOR.
Accuracy	<ul style="list-style-type: none"> • Laboratory surrogate spike recoveries were to be within 70 – 130% for all organic analyses (if applicable). • Laboratory control sample (LCS) recoveries to be assessed at a rate of one (1) sample per laboratory batch. LCS recoveries were to be within 70 – 130% (if applicable). • Matrix spike (MS) recoveries to be assessed at a rate of at a rate of one (1) sample per laboratory batch. LCS recoveries were to be within 70 – 130% (if applicable).
Representativeness	<ul style="list-style-type: none"> • Appropriate sampling methods undertaken for all samples. • All samples were extracted and analysed within holding times. • One laboratory blank collected per laboratory batch. All laboratory blank analytical results were below the laboratory LOR. • One (1) trip spike is to be submitted with each sampling batch. Trip spike recoveries are to be within 70 – 130% (if applicable). • One (1) trip blank is to be submitted with each sampling batch. Trip spike recoveries are to be within 70 – 130% (if applicable). • One (1) Rinsate sample is to be submitted with each sampling batch or where rinsate is required during field QA/QC procedures. All target analytes within the rinsate sample are to be below the prescribed laboratory LOR.
Comparability	<ul style="list-style-type: none"> • Sampling was completed in accordance with the recommended methods outlined within Section 5, Systematic planning for collection of environmental data, in Schedule B2 of NEPM (2013), AS 2005 and ADE Standard Operating Procedures (SOPs). • Standard analytical methodologies were used by laboratories which were NATA accredited for the requested analyses. • Laboratory LORs were appropriate and consistent for the objectives of the validation assessment.
Completeness	<ul style="list-style-type: none"> • Field documentation complete and appropriate for all samples to meet objectives of the validation assessment. • Sample description and COC documentation complete and appropriate for all samples to meet the objectives of the validation assessment. • The sampling frequency and findings of the QA/QC sample review valid for >95% of samples.
Types of Decision Errors	<p>The planning team determined that the two decision errors were:</p> <ol style="list-style-type: none"> deciding that soil on Site is contaminated when it truly is not; and deciding that soil on Site is not contaminated when it truly is. <p>The true state of nature for decision error (i) is that soil is not contaminated.</p> <ul style="list-style-type: none"> • The true state of nature for decision error (ii) is that soil is contaminated.

5.7 Step 7 – Optimize the Design for Obtaining Data

The organisation of the data collection and analysis design for optimising the generation of data to satisfy the DQOs and the objective of the investigation has been achieved via the following procedures outlined in Table 6 below.

Table 6. Summary of Procedures to be Undertaken to Optimise the Design for Obtaining Data.

Pre-approved Work Plan	The sampling, analysis and quality plan for the investigation at the site has been developed to assess the concentrations of contaminants present in soil and groundwater at the site through the implementation of the components outlined within NEPC (2013), AS 4482.1 (2005) and AS/NZS 5667.1 (1998).
Compliance with EPA Guidelines	<ul style="list-style-type: none"> • Use of appropriate techniques for the sampling, storage and transportation of samples. • Implementation of NATA certified laboratory using analytical procedures as outlined in NEPM (NEPC, 2013). • Use of a secondary laboratory for split samples which is NATA certified for the required analyses.

6 Sampling Plan, Methodology, Field Investigations, and Investigation Pattern

6.1 Pre-work Procedure

Prior to mobilisation to Site, a job-specific Safety, Health & Environmental Work Method Statement (SH&EWMS) was developed, which was presented in a pre-start meeting prior to the commencement of works and signed on to by ADE staff and contractors.

6.2 Sampling Design Plan Rationale

The Site investigation and soil sampling procedures were developed in consultation with the NSW EPA Sampling Design Guidelines (NSW EPA, 1995). A targeted sampling regime was designed to collect representative samples from the footprint of the proposed development area / excavation. A total of 22 sampling locations were completed across the Site utilising a systematic-grid sampling pattern. As mentioned in Table 3, sampling locations were altered on site due to limited access for drill rig, underlying services, dripline of trees and proximity to the residential buildings.

6.3 Soil Sampling Methodology

Prior to the commencement of any excavation works, previously identified under-ground services were located by a qualified service locator, which was later followed by Non-Destructive Digging (NDD) using a hand-auger to 1 m BGL or until natural was encountered prior to the commencement of drilling operations. The intrusive investigation involved sample collection via a mixture of drilling boreholes using a Geoprobe 7822DT, utilising both Direct Push Tube (DPT) (Boreholes 1-15, 17, 18 and 20-22). and via a hand-auger (Boreholes 1, 11, 16 and 19).

The sampling was undertaken on the 30th of November and 1st of December 2020 by experienced environment consultants with samples collected at varying depths in between the surface and 2 m BGL with the purpose of targeting the topsoil, fill and natural profiles. Samples were collected using dedicated nitrile gloves and placed in laboratory prepared, analyte suitable containers involving the use of sterile glass jars lined with Teflon lids for chemical analysis, High-Density Polyethylene (HDPE) jars for PFAS analysis and small zip lock bags for asbestos analysis.

The samples collected for chemical (excluding PFAS) were placed within a pre-chilled esky or cooler box with ice packs or equivalent to maintain samples at approximately 4°C. PFAS samples were stored within a separate, designated esky and placed in a cool, dry place out of direct sunlight. The original Chain of Custody (CoC) form was enclosed in the Esky that was then sealed and dispatched to NATA accredited analytical laboratories.

Following the collection of each sample, a PID with a 10.6 eV lamp, pre-calibrated with isobutylene gas at 100 ppm was used to screen the headspace gases of the collected samples to assess for the presence of VOCs. The PID headspace screening was conducted using a resealable zip lock plastic bag, the soil sample was agitated as the PID reading was taken inside the zip lock plastic bag (the bag was appropriately sealed when inserting the PID).

A total of 44 primary soil samples, two (2) inter-laboratory duplicates, two (2) intra-laboratory duplicates, two (2) trip blank / spike and one (1) rinsate sample (QA/QC) was collected throughout the course of the investigation. All samples were submitted to a NATA accredited laboratory for analysis in accordance with the recommended holding times on a standard (5-day) turnaround time (refer to Table 7 for the adopted sampling and analytical program).

6.4 Equipment Decontamination

Dedicated disposable materials (e.g. nitrile gloves) were changed between each sampling point. All disposable sampling equipment / materials were collected and removed prior to leaving the Site. All non-disposable sampling equipment was decontaminated by a three-stage decontamination process which included rinsing the piece of equipment with PFAS free denoised water, followed by a rinse of a PFAS free detergent (Liquinox) and a final rinse using PFAS free deionised water.

6.5 Documentation

A field observation log was kept by sampling personnel during all phases of soil and groundwater sampling. Details recorded in the log included:

- Borehole and sample number;
- Soil profile notes;
- Sampling method;
- Sample identification;
- Sample description; and
- Sample point measurements.

A comprehensive master sample register was maintained. As samples were received, they were given a unique sequential number from the sample register into which details from the labels were entered. Before packing and dispatch of samples for analysis, a CoC form was completed (refer to *Appendix V – Chain of Custody Documentation and Analytical Reports*). This form recorded details of the individual samples being dispatched and the type of analysis required for each sample.

6.6 Laboratory Submission

Samples were analysed by Sydney Laboratory Services (SLS) (primary laboratory), and Australia Laboratory Services (ALS Global) (secondary laboratory), specifically:

- 44 primary soil samples collected by ADE on the 30th of November and 1st of December 2020 for analysis of eight (8) Heavy Metals, TRHs, PAHs, BTEX and Napthalene were submitted to SLS;
- 11 primary soil samples collected by ADE on the 30th of November and 1st of December 2020 for analysis of OCP/OPPs and PCBs were submitted to SLS;
- 22 primary soil samples collected by ADE on the 30th of November and 1st of December 2020 for analysis of PFAS were submitted to SLS;
- 13 primary soil samples collected by ADE on the 30th of November and 1st of December 2020 for analysis of asbestos (presence/absence) were submitted to SLS;
- Two (2) blind replicate samples (QAQC) collected by ADE on the 30th of November 2020 for analysis of Heavy Metals, TRHs, PAHs, BTEX, OCPs and OPPs were submitted to SLS;
- Two (2) split replicate (QAQC) collected by ADE on the 30th of November 2020 for analysis of Heavy Metals, TRHs, PAHs, BTEX, OCPs, OPPs were submitted to ALS Global;
- One (1) rinsate samples (QAQC) collected by ADE on the 1st of December 2020 for analysis of Heavy Metals, TRHs, PAHs, BTEX, OCPs, OPPs were submitted to ALS Global; and
- Two (2) trip blank / spike samples (QAQC) collected on the 30th of November and 1st of December 2020 for analysis of BTEX was submitted to SLS.

Table 7 outlines the sampling and analytical program for analysis of soil including soil QAQC samples collected within the site during the investigation. Refer to *Appendix V – Analytical Reports* and *Chain of Custody* for the analytical methods by the selected laboratories.

Table 7. Sampling and Analytical Program for the Site Investigation (refer to *Appendix I – Site Maps, Figure 3* for sample locations).

Borehole Number	Depth / m BGL	Sample Type	Analysis					
			Full Suite ¹	OCPs, OPPs, PCBs	BTEX Only	Asbestos ²	PFAS (Short suite)	PID Field Screening
BH1	0.3	Soil / Fill	X			X		X
	0.5	Soil / Fill	X	X			X	X
	1.3	Soil / Natural	X					X
BH2	0.3	Soil / Fill	X				X	X
	0.9	Soil / Contact ³	X					X
BH3	0.5	Soil / Fill				X		X
	0.9	Soil / Contact	X				X	X
	1.4	Soil / Natural	X					X
BH4	0.2	Soil / Fill	X				X	X
	0.6	Soil / Contact	X					X
BH5	0.5	Soil / Fill	X			X	X	X
	0.9	Soil / Contact	X					X
BH6	0.5-0.6	Soil / Fill	X	X				X
	1.0-1.1	Soil / Natural	X				X	X
BH7	0.2-0.3	Soil / Fill	X			X		X
	0.5-0.6	Soil / Fill	X				X	X
BH8	0.2-0.3	Soil / Fill	X				X	X
	0.8-0.9	Soil / Contact	X					X
BH9	0.3-0.4	Soil / Fill	X			X	X	X
	0.5-0.6	Soil / Contact	X					X
BH10	0.5-0.6	Soil / Fill	X					X
	0.7-0.9	Soil / Contact	X				X	X
BH11	0.3-0.4	Soil / Fill	X			X	X	X
	0.5-0.6	Soil / Fill	X	X				X
BH12	0.7-1.0	Soil / Contact	X				X	X
	1.1-1.3	Soil / Natural	X	X				X
BH13	0.2-0.3	Soil / Fill				X		X
	0.5-0.6	Soil / Fill	X				X	X
	1.1-1.2	Soil / Contact	X					X
BH14	0.5-0.6	Soil / Fill	X				X	X
	0.9-1.0	Soil / Natural	X					X
BH15	0.2-0.3	Soil / Fill	X				X	
	0.6-0.8	Soil / Contact	X					
BH16	0.3-0.4	Soil / Fill	X	X			X	X
BH17	0.1-0.3	Soil / Fill	X					
	0.3-0.5	Soil / Fill				X		
	0.5-0.8	Soil / Contact	X	X			X	
BH18	0.3-0.5	Soil / Fill	X				X	X
	1.5-1.7	Soil / Fill	X					X
BH19	0.2-0.3	Soil / Fill	X	X		X	X	X

Borehole Number	Depth / m BGL	Sample Type	Analysis					
			Full Suite ¹	OCPs, OPPs, PCBs	BTEX Only	Asbestos ²	PFAS (Short suite)	PID Field Screening
BH19	0.9-1.0	Soil / Natural	X					X
BH20	0.2-0.4	Soil / Fill	X	X		X	X	X
	0.4-0.6	Soil / Contact	X					X
BH21	0.1-0.2	Soil / Fill				X		X
	0.2-0.4	Soil / Fill	X	X		X	X	X
	0.7-0.8	Soil / Natural	X	X				X
BH22	0.2-0.4	Soil / Fill	X	X		X	X	X
	0.4-0.6	Soil / Natural	X					X
BR1	-	Soil	X					
BR2	-	Soil	X					
SR1	-	Soil	X					
SR2	-	Soil	X					
Rinsate 01	-	Water	X	X				
TB1	-	Water			X			
TB2	-	Water			X			
TS1	-	Water			X			
TS2	-	Water			X			

Notes to Table 7

1 – Full suite of analysis includes TRHs, BTEX, PAHs, and heavy metals.

2 – Asbestos analysis absence / presence.

3 – Contact between natural and fill soil profiles.

7 Assessment Criteria

7.1 Soil Assessment Criteria

The assessment criteria specified in the following publications were employed for this DSI:

- NEPC, National Environmental Protection Measure [NEPM] Schedule B1 (NEPC, 2013);
- NSW EPA, Excavated Natural Material Order 2014 (NSW EPA, 2014a);
- NSW EPA, Waste Classification Guidelines. Part 1: Classifying Waste (NSW EPA, 2014b); and
- HEPA, PFAS National Environmental Management Plan (NEMP) v2.0 (HEPA, 2020).

7.1.1 Health Investigation Level (HILs)

The NEPM (2013) guidelines stipulate four (4) generic land use settings for assessment used in the first stage (Tier 1 or 'screening') of potential risks to human health for a broad range of metals and organic substances. The HILs are applicable for assessing human health risk via all relevant pathways of exposure. The four HIL categories are used to assess human health risk via all relevant pathways of exposure for the following broad land use categories:

- HIL-A - Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake, no poultry, also includes children's day care centres, preschools and primary schools);
- HIL-B - Residential with minimal opportunities for soil access includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats;
- HIL-C - Public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. It does not include undeveloped public open space (such as urban bushland and reserves) which should be subject to a Site-specific assessment where appropriate; and
- HIL-D - Commercial / industrial such as shops, offices, factories and industrial Sites.

Based on available information, the future usage of the site will include of four (4) residential towers with commercial properties, a community centre and library on the ground floors. In addition, 4000 m² of public park will be developed centrally within the site. Therefore, HIL-B, HIL-C and HIL-D criteria has been adopted for the purposes of this investigation. A summary of the applicable HILs in soil is presented in Table 8 below.

Table 8. Summary of HILs in Soil, adapted from Table 1A(1), Schedule B1 of NEPM (2013).

Analyte	HILs for Residential B (mg/kg)	HILs for Recreational C (mg/kg)	HILs for Commercial/Industrial D (mg/kg)
Metals			
Arsenic (total)	500	300	3000
Cadmium	90	90	900
Chromium (VI)	500	300	3600
Copper	30000	17000	240000
Lead	1200	600	1500
Mercury (inorganic)	120	80	730
Nickel	1200	1200	6000
Zinc	60000	30000	400000
PAHs			
Carcinogenic PAHs (as BaP TEQ) ²	4	3	40
Total PAHs	400	300	4000
PCBs			

Analyte	HILs for Residential B (mg/kg)	HILs for Recreational C (mg/kg)	HILs for Commercial/Industrial D (mg/kg)
Total PCBs	1	1	7
Pesticides			
DDT+DDE+DDD	600	400	3600
Aldrin and Dieldrin	10	10	45
Chlordane	90	70	530
Endosulfan	400	340	2000
Endrin	20	20	100
Heptachlor	10	10	50
Hexachlorobenzene	15	10	80
Methoxychlor	500	400	2500
Chlorpyrifos	340	250	2000

7.1.2 Health Screening Level (HSLs)

HSLs have been developed for selected petroleum compounds and fractions and are applicable to assessing human health risk via the inhalation and direct contact pathways. The HSLs depend on specific soil physicochemical properties, land use scenarios, and the characteristics of building structures.

Due to the nature of the development having all fill materials outside of the DSZ removed for the construction of an underground carpark with ventilation ADE is of the opinion that the inclusion of HSLs and soil vapour assessment is not deemed required within the scope of this investigation.

7.1.3 Ecological Investigation Levels (EILs)

ADE understands that the proposed future land use will include the construction of public open space and retail shops. To assess the impact on ecosystems including site vegetation from contamination within the upper 2 m of the subsurface, Schedule B1 of NEPM (*NEPC, 2013*) presents Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs) for different land uses. Urban Residential / Public Open Space and Commercial/Industrial is the adopted land use criteria for this investigation.

The methodology outlined in Schedule B1 NEPM (*NEPC, 2013*) was developed to protect soil processes, soil biota (flora and fauna), terrestrial invertebrates and vertebrates. Derivation of Site specific EILs for metals (Cr, Cu, Ni & Zn) involves first establishing the appropriate added contaminant limit (ACL) values from Table 1B(1) – 1B(3) of Schedule B1 of the NEPM (*NEPC, 2013*). The tables consider the land use purposes as well as soil-specific properties such as pH and CEC to determine the CoPCs recommended ACL. Please note that the generic ACL for lead (Pb) is taken directly from Table 1(B)4 of Schedule B1 of the NEPM (*NEPC, 2013*) and the CEC and pH were derived from the “*Digital soil maps for key soil properties over New South Wales, version 1.2*” available on eSPADE (*NSW DPIE, 2020*) which employs an interpolation method to calculate site specific soil pH and CEC. The ACL values are then added to the respective ambient background concentration (ABC) of the contaminant, determined via suitable reference data or baseline investigations, to produce the site specific EIL (EIL = ABC + ACL).

ADE used an average of the natural samples to calculate site specific ABC data as seen in *Appendix – II Analytical Results Table* and summarised in Table 9 on the following page.

Therefore, for the purpose of this investigation ADE has calculated the relevant ACL values and conservatively adopted them as the EIL. Additionally, the EIL criteria presented for arsenic (As), naphthalene and DDT are generic EIL values irrespective of their physicochemical properties sourced from Table 1(B)5 of Schedule B1 of the NEPM (*NEPC, 2013*).

The sampling methodology employed during the sampling event did not allow for the collection and testing. The site-specific soil properties used to calculate the EILs are shown in Table 9 below. ADE calculated the average of the values as an estimation of the true population mean and adopted these values in the derivation of the site specific EILs. The calculated EIL is shown in Table 11. Please note that no clay content data was obtained for the derivation of Cr ACL and therefore the most conservative ACL value was adopted.

Table 9. EIL Criteria.

Heavy Metal	Adopted site specific ACL ⁷	Urban Residential and Open Public Spaces (mg/kg)	Commercial / Industrial (mg/kg)
Cr ²	10	191	311
Cu ³	5.3	100.3	145.3
Ni ⁵	10	40	65
Zn ⁶	16	116	166
As ¹	-	100	160
Pb ⁴	11	1100	1800
Naphthalene ¹	-	191	311
DDT ¹	-	100.3	145.3

Notes to Table 9

- 1- Generic EIL, as per Table 1B(5) of Schedule B1 of NEPM (2013).
- 2- In the absence of clay content data available, most conservative Cr (III) ACL adopted as EIL, per Table 1B(3) of Schedule B1 of NEPM (2013).
- 3- Cu ACL calculated using eSpade CEC data and adopted as EIL, per Table 1B(2) of Schedule B1 of NEPM (2013).
- 4- Generic ACL for Pb conservatively adopted as EIL, per Table 1B(4) of Schedule B1 of NEPM (2013).
- 5- Ni ACL calculated using eSpade CEC data and adopted as EIL, per Table 1B(3) of Schedule B1 of NEPM (2013).
- 6- Zn ACL calculated using eSpade pH and CEC data and adopted as EIL, per Table 1B(1) of Schedule B1 of NEPM (2013).
- 7- Adopted site specific ACL derived from an average of all samples taken from the residual horizon as seen in APPENDIX II – Analytical Results Table.

7.1.4 Ecological Screening Levels (ESLs)

ESLs have been developed for TRH, BTEX and benzo(a)pyrene in soils and are applicable for assessing risk to terrestrial ecosystems. ESLs broadly apply to coarse- and fine-grained soils with various land uses. Field and soil data collected from the investigation indicate the predominant soil type to be silty sand fill underlain by residual sand and sandstone was encountered. Fine grained soil texture was therefore selected for the derivation of ESLs for this investigation, as summarised in Table 10 below.

Table 10. ESLs adopted for Site Investigation

Contaminant	Soil Texture	ESLs ¹ (mg/kg)
TRHs		
TRH C ₆ -C ₁₀ (F1) ²	Coarse / Fine	180*
TRH >C ₁₀ -C ₁₆ (F2) ²	Coarse / Fine	120*
TRH >C ₁₆ -C ₃₄ (F3) ²	Fine	1300
TRH >C ₃₄ -C ₄₀ (F4)	Fine	5 600
BTEX		
Benzene ²	Fine	65
Toluene ²	Fine	105
Ethylbenzene ²	Fine	125
Xylene ²	Fine	45
PAHs		
Benzo(a)pyrene ³	Coarse/ Fine	1.4

Notes to Table 10

- 1- Generic ESL adopted conservatively based on fine soil texture, per Table 1B(6) of Schedule B1 of NEPM (2013).
- 2 - ESLs are of low reliability except where indicated by * which indicates that the ESL is of moderate reliability.
- 3- The Standing Council on Environment and Water (SCEW) amended the National Environment Protection (Assessment of Site Contamination) Measure 1999 (the NEPM) on 16 May 2013 to include the revised ESL for BaP.

7.1.5 Asbestos

Due to proposed scope of works, sampling was undertaken using a push tube drill rig and / or hand auger, quantification sampling of asbestos in soils as per NEPM (NEPC, 2013) was not able to be undertaken. ADE therefore adopted a presence / absence approach for initial asbestos assessment at the Site in accordance with Australian Standard, *Method for the qualitative identification of asbestos in bulk samples, Standards Australia (AS4964-2004)*.

If asbestos is identified within soils, and / or soils are proposed to be retained on site, further asbestos quantification sampling will be required to determine the concentration of asbestos within the soil. The soil material proposed to be retained on site will be assessed, as per NEPM (NEPC, 2013), including 10L asbestos screening for bonded ACM and the collection of 500 mL soil samples for analysis of asbestos fines (AF) and fibrous asbestos (FA). Further information can be referred to in the Western Australia Department of Health (WA DoH) Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, May 2009 (WA DoH, 2009).

7.1.6 PFAS Assessment Criteria

To assess the potential risk of PFAS related contamination to both human health, ADE has adopted the Health Investigation Levels assigned for High Density Residential (HIL B), Recreational/Public Open Space (HIL C) and Commercial Industrial (HIL D) as referenced within the PFAS National Environmental Management Plan (NEMP, 2020). To assess for the potential ecological impacts of PFAS within soil, ADE has adopted the indirect ecological soil guideline which accounts for the various pathways throughout which organisms may or may not be in direct contact with PFAS contaminated soil. A summary of the PFAS related assessment criteria for the Site is provided within Table 11 below.

Table 11. Site Assessment Criteria - PFAS HILs and Ecological Exposure Limits for Soil Contamination

Analyte	HILs for Residential B (mg/kg)	HILs for Recreational C (mg/kg)	HILs for Commercial/ Industrial D (mg/kg)	Ecological Indirect Exposure (mg/kg)
Sum of PFOS & PFHxS	2	1	20	-
PFOA	20	10	50	-
PFOS	-	-	-	0.01 ¹

Notes to Table 11

1-Indirect ecological exposure accounts for the multiple pathways which may exist through which organisms can be exposed to PFAS contaminated soil i.e., food chain. For the purposes of this investigation, the most conservative value has been adopted.

7.1.7 Excavated Natural Material Order 2014

To provide an indicative assessment with regards to potential offsite disposal options, ADE has compared the analytical data collected during the investigation against the NSW EPA Excavated Natural Material (ENM) Order 2014. Please note for the purpose of this investigation, foreign materials, pH and EC were not analysed as the sampling method adopted for this DSI did not allow for the required 6 kg sample required for foreign materials to be collected.

Table 12. Site Assessment Criteria – ENM Order 2014

Analytes	Threshold Criteria	
	Maximum average concentration for ENM characterisation (mg/kg)	Absolute maximum concentration for ENM characterisation (mg/kg)
Metals		
Arsenic	20	40
Cadmium	0.5	1
Chromium (total)	75	150
Copper	100	200
Lead	50	100
Mercury	0.5	1
Nickel	30	60
Zinc	150	300
Other		
EC	1.5 dS/m	3 dS/m
pH ¹	5 to 9	4.5 to 10
TRH		
C ₆ -C ₁₀ Total Petroleum Hydrocarbons	N/A	N/A
C ₁₀ -C ₃₆ Total Petroleum Hydrocarbons	250	500
BTEX		
Benzene	N/A	0.5
Toluene	N/A	65
Ethylbenzene	N/A	25
Xylenes	N/A	15
PAHs		
Benzo(a)pyrene	0.5	1
PAH total	20	40
Foreign Materials		
RTA Foreign Materials ²	0.05%	0.10%

Notes to Table 12

NA – Not Applicable

1 – The range given for pH are for the minimum and maximum acceptable pH values in the ENM guide.

2 – Test includes rubber, plastic, bitumen, paper, cloth, paint, and wood. (Wood refers to construction timber only; naturally occurring wood, twigs, roots, etc. are excluded).

7.1.8 Waste Classification Guidelines - Part 1: Classifying Waste (NSW EPA 2014;2016)

For material to be excavated that does not meet the contaminant thresholds of the ENM Order 2014, ADE has compared the analytical data collected during the investigation against the NSW EPA Waste Classification Guidelines - Part 1: Classifying Waste (NSW EPA, 2014) and the Addendum to the Waste Classification Guidelines (2014) - Part 1: Classifying Waste (NSW EPA, 2016).

For purposes of classifying the fill materials across the Site, ADE adopted the CT, SCC, and Toxicity Leaching Procedure (TCLP) criteria assigned to General Solid Waste (CT1/SCC1/TCLP1) and Restricted Solid Waste (CT2/SCC2/TCLP2). A summary of the adopted waste classification criteria is provided in Table 13 below.

Table 13. Site Assessment Criteria - Waste Classification of Soil Materials

Analytes	Maximum Values of Total Concentration Assigned for General Solid Waste CT1/CT2 (mg/kg)	Maximum Values of Total Concentration Assigned for General Solid Waste TCLP1 (mg/L) / SCC1 (mg/kg)	Maximum Values of Total Concentration Assigned for General Solid Waste TCLP2 (mg/L) / SCC2 (mg/kg)
PAHs			
Total PAHs	200/800	NA/200	NA/800
Benzo(a)pyrene	0.8/3.2	0.04/10	0.16/23
OCPs			
Endosulfan ¹	60/240	3/108	12/432
OPPs			
Chlorpyrifos	4/16	0.2/7.5	0.8/30
TRH			
C ₆ –C ₉ Petroleum Hydrocarbons	650/2,600	NA/650	NA/2600
C ₁₀ –C ₃₆ Petroleum Hydrocarbons	10,000/40,000	NA/10,000	NA/40,000
PCBs			
Total PCB	<50/<50	NA	NA
BTEX			
Benzene	10/40	0.5/18	2/72
Toluene	288/1,152	14.4/518	57.6/2073
Ethylbenzene	600/2,400	30/1,080	120/4320
Xylenes (Total)	1,000/4,000	50/1,800	200/7200
Metals			
Arsenic	100/400	5.0/500	20/2000
Cadmium	20/80	1.0/100	4/400
Chromium ²	100/400	5/1,900	20/7600
Copper	NA	NA	NA
Lead	100/400	5.0/1,500	20/6000
Mercury	4.0/16	0.2/50	0.8/200
Nickel	40/160	2.0/1,050	8/4200
Zinc	NA	NA	NA
PFAS			
PFOS + PFHxS ³	N/A	0.05/1.8	0.2/7.2
PFOA	N/A	0.50/18.0	2.0/72.0

Notes to Table 13

1- Endosulfan (CAS Registry Number 115-29-7) means the total of Endosulfan I (CAS Registry Number 959-98-8), Endosulfan II (CAS Registry Number 891-86-1) and Endosulfan sulfate (CAS Registry Number 1031-07-8).

2- Chromium (Total)

3- PFOS and PFHxS are to be summed for comparison against the TCLP and SCC values

*ND- Not detected/below Practical Quantitation Limit (PQL)

NA- Not Applicable

7.1.9 Virgin Excavated Natural Material

For the purposes of classifying the underlying virgin soil materials, the material was validated as Virgin Excavated Natural Material (VENM) as per the Protection of the Environment Operations Act 1997 (NSW) (POEO Act). The POEO Act 1997 defines VENM as:

‘Natural material (such as clay, gravel, sand, soil or soil fines):

- Excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial, mining or agricultural activities;
- Does not contain any sulfidic ores or soils or any other waste; and
- Includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved for the time being pursuant to an EPA Gazettal notice.’

To determine the underlying virgin soils suitability as VENM, the background ranges outlined in the Field Geologist’s Manual, compiled by D.A Berkman (D.A. Berkman, 1989) and the Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites (ANZECC, 1992) were adopted and are summarised below in Table 14.

Table 14. Chemical Characterisation of VENM material.

Analytes	Berkman (1989) Background Range ¹	ANZECC (1992) Background Range ²
Metals		
Arsenic	1-50	0.2-30
Cadmium	1	0.04-2
Chromium (III) ³	5-1000	0.5-110
Copper	2-100	1-190
Lead	2-200	<2-200
Mercury	0.03	0.001-0.1
Nickel	5-500	2-400
Zinc	10-300	2-180
TRHs		
TRH Fraction C ₆ -C ₁₀	ND	ND
TRH Fraction C ₁₀ -C ₁₆	ND	ND
TRH Fraction C ₁₆ -C ₃₄	ND	ND
TRH Fraction C ₃₄ -C ₄₀	ND	ND
Pesticides		
DDT + DDD + DDE	ND	ND
Chlordane	ND	ND
Aldrin + Dieldrin	ND	ND
Endosulfan	ND	ND
PCBs		
Total PCBs	ND	ND
BTEX		
Benzene	ND	ND
Toluene	ND	ND
Ethylbenzene	ND	ND
Xylenes (Total)	ND	ND
PAHs		
Benzo(a)pyrene	ND	ND
PAH (Total)	ND	ND
Other		
Asbestos	ND	ND
PFAS	ND	ND

Notes to Table 16

ND – Not detected / below Practical Quantitation Limit (PQL)

NA – Not Applicable

1 Background ranges, taken from the Field Geologist’s Manual, compiled by D A Berkman, Third Edition 1989. Publisher – The Australasian Institute of Mining & Metallurgy (Berkman, 1989)

2 Background ranges, taken from the Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites, Environmental Soil Quality Guidelines Background A (ANZECC, 1992)

3 Concentrations reported as Chromium (total)

7.2 Aesthetics

As outlined in Section 3.6, Aesthetic considerations, in Schedule B1, of NEPM (2013) aesthetic quality of accessible soils should be considered even if analytical testing demonstrates that concentrations of CoPCs are within the SAC.

It should be noted that there are no quantifiable guidelines in determining if soils are appropriately aesthetic. As stated in Section 3.6.3, Assessment process for aesthetic issues, in Schedule B1, of NEPM (2013) professional judgement with regard to quantity, type and distribution of foreign materials and/or odours in relation to the specific land use should be employed.

The following examples would trigger further aesthetic assessment:

- Hydrocarbon sheen on surface water;
- Anthropogenic soil staining; and
- Odorous soils (i.e., hydrocarbon or hydrogen sulphide odours).

7.3 Statistical Treatment

Analytical results from the soil sampling program are statistically analysed to determine their applicability to the assessment and recommendation of remedial actions in the event of Site assessment criteria exceedances.

A contaminant concentration in soil will be deemed a non-exceedance if:

- The maximum concentration of all samples meets the specified acceptance criteria; or
- The 95% Upper Control Limit (UCL) is below the acceptance criteria with the following criteria:
- The standard deviation of the results should be less than 50% of the relevant investigation or screening level; and
- No individual exceedance should exceed 250% of the relevant investigation or screening level.

If the 95% UCL of the arithmetic mean of a contaminant concentration is above the acceptance criteria, then the soil will be classified as contaminated and will require further assessment, remediation, removal, or management.

If the 95% UCL of the arithmetic average concentrations is below the acceptance criteria, and no concentrations are at a hotspot level, slight elevations above the acceptance criteria may be considered to pose an insignificant human health or environmental risk. The location will hence be considered a non-exceedance requiring no further assessment, remediation, removal, or management.

8 Data Quality Assessment

In order to carry out the assessment of the data acquired in the course of the investigation, the US EPA Guidelines including, but not limited to, the 'Guidance on Assessing Quality Systems' (2003) and 'Guidance on Systematic Planning using the Data Quality Objectives Process' (2006) were used.

The guidelines provide general strategy on assessing data quality criteria and performance specifications for decision making. The following is the output from most of the steps of the Data Quality Assessment (DQA) Process provided in the guidelines. Quality control reports from the laboratories for sample analyses were reviewed. The review included an assessment of blank, duplicate, control, and spiked samples. The review of the QA/QC program was conducted in accordance with NSW EPA recommendations.

8.1 Data Review

Quality control reports from the laboratories subcontracted for sample analyses were reviewed. Laboratory blank samples, duplicate samples, control samples, spiked samples and method blanks were evaluated (refer to *Appendix V - QAQC Output*).

This review was conducted in accordance with the items recommended by the NSW EPA for inclusion in the consultants' reports. Some additional recommendations from the US EPA methodology, as referred to by AS 4482.1, were also followed.

Following the QA/QC assessment, the validity of the results is determined based on the assessment criteria adopted with the results expressed as either valid or invalid data (acceptable or unacceptable). The laboratory QA/QC sections can be found in their corresponding internal laboratory QA/QC reports (refer to *Appendix V – Chain of Custody Documentation and Laboratory Analytical Reports*).

8.1.1 COC

Australian Standard AS 4482.1 defines the Chain-Of-Custody (COC) documentation as the link in the transfer of samples between the time of collection and arrival at the laboratory.

The COC utilised by ADE included the items recommended by the Standard:

- Person transferred the samples;
- Person who received the samples;
- Date the samples were collected;
- Date the samples were received at the laboratory; and
- Contact name and details for the client.

Copies of the COCs completed during the course of this investigation are provided in *Appendix V – Chain of Custody Documentation and Laboratory Analytical Reports*.

8.1.2 Record of Holding Times

The objective is to ascertain the validity of the analytical results based on meeting the holding time for the samples from the time of collection to the time of analysis.

All samples collected over the course of the investigation were submitted within three (3) days of the initial sampling event. As such, the holding times of all samples to the final submission to the laboratories used (SLS and ALS) meet the recommended holding time criteria, with all samples analysed within 7 days from the time of collection (refer to *Appendix VI – QAQC Output*).

8.1.3 Field Equipment Calibration

Field equipment requiring calibration included the use of a pre-calibrated PID with a 10.6 eV lamp. The item is calibrated by an external qualified technician every 12 months or as prescribed by the technician (refer to *Appendix VII - Calibration Certificates*).

8.1.4 Analytical Methods Used

Analysis was undertaken by NATA accredited laboratories using US EPA approved methodologies. Refer to *Appendix V – Chain of Custody Documentation and Laboratory Analytical Reports* for the analytical methods used by the laboratories, which in all cases were deemed appropriate for the required analyses.

8.1.5 Laboratory Accreditation for Analytical Methods Used

Analysis was undertaken in NATA accredited laboratories using US EPA approved methodology. Refer to *Appendix V – Chain of Custody Documentation and Laboratory Analytical Reports*, for the details of laboratory accreditations for analytical methods used. The laboratory accreditation of SLS and ALS were deemed suitable for the required analyses.

8.1.6 Detection Limits / Practical Quantification Limits

The smallest amount of a substance that can be detected by the laboratories used – SLS and ALS, above the background method noise in a procedure and within a stated confidence level is referred as detection limit. Current practice identifies several detection limits including the following: (1) the instrument detection limit (IDL), (2) the lower level detection limit (LLD), the method detection limit (MDL) and the practical quantitation limit (LOR).

The relationship among these levels is approximately IDL: LLD: MDL: LOR = 1: 2: 4: 10. Refer to SLS and ALS for the list of LORs provided by their respective laboratories. When dilution of a sample is involved in the sample preparation, the method detection limit is adjusted by the dilution factor.

8.2 Field QA/QC

A summary of the QA/QC samples collected during field works is provided in Table 15 below.

Table 15. Summary of Field QA/QC Samples.

Field QA/QC	Frequency	Sample Details	Field QA/QC Frequency Achieved?
Blind replicate samples	1 per 20 samples	<ul style="list-style-type: none"> Two (2) blind replicate samples were collected during the investigation. <ul style="list-style-type: none"> BR1 is an intra-laboratory replicate of primary sample BH1(0.3); and BR2 is an intra-laboratory replicate of the primary sample BH6(1.0-1.1). 	Yes
Split Replicate samples	1 per 20 samples	<ul style="list-style-type: none"> Two (2) split replicate samples were collected during the investigation. <ul style="list-style-type: none"> SR1 is an intra-laboratory replicate of primary sample BH1(0.3); and SR2 is an intra-laboratory replicate of the primary sample BH6(1.0-1.1). 	
Rinsate Sample	1 per sampling event	<ul style="list-style-type: none"> One (1) rinsate sample was collected during the investigation. 	
Trip Blank	1 per sampling event	<ul style="list-style-type: none"> Two (2) trip Blank samples were utilised during the investigation . 	

Field QA/QC	Frequency	Sample Details	Field QA/QC Frequency Achieved?
Trip Spike	1 per sampling event	<ul style="list-style-type: none"> Two (2) trip Spike (spiked BTEX) samples were utilised during the investigation. 	

8.2.1 Blind and Split Replicate Samples

Australian Standard 4428.1 and the NEPM (2013) specifies the typical Relative Percentage Data (RPD) values for replicate samples to be below 30%. If both samples' values are less than the Limits of Reporting (LOR), the RPD is not calculated. Valid values are sample concentrations that fall within the control limits of 0-30% described above. Invalid values are concentrations that are outside of the control limits.

- Two (2) intra-laboratory blind replicate samples were collected to determine the variability of the sampling process. The replicate sample was collected simultaneously from the same source and under identical conditions as the primary samples.
- The blind replicate samples showed 149 valid values and two (2) invalid values.
- Two (2) inter-laboratory split replicate samples were collected to measure the variability between the laboratory analysis process. The primary samples were submitted to SLS and was compared to the replicate samples submitted to ALS.
- The variability assessment showed 132 valid values and one (1) invalid values.

8.2.2 Rinsate Samples

- One (1) rinsate sample was analysed to check on the decontamination procedures undertaken on Site.
- Analysis of the rinsate samples showed 89 valid values and nil invalid values.

8.2.3 Trip Blank Samples

- Two (2) trip blank samples were prepared for the field investigation. The samples were stored with the collected samples throughout the sampling event.
- The trip blank samples were then packaged for shipment with the other representative samples and submitted for analysis. Trip blanks are used to determine if samples were contaminated during storage and/or transportation back to the laboratory (a measure of sample handling variability resulting in positive bias in contaminant concentration).
- The trip blank samples analysed returned results below the detection limit, resulting in ten (10) valid values and nil invalid values.

8.2.4 Trip Spike Samples

- Two (2) trip spike (spiked BTEX) samples were analysed in order to estimate the loss of volatile compounds during the storage, handling, and transportation of the investigation samples. The samples were prepared by SLS prior to the field work and spiked with a concentration of 40 µg/L of BTEX.
- The trip spike samples analysed returned results within the adopted criteria being 60 to 140 percent of the original concentration, resulting in ten (10) valid values and nil invalid values.

8.3 Laboratory QA/QC

8.3.1 Laboratory Duplicates

- Duplicate sample determinations were provided by the laboratories to demonstrate acceptable method precision at the time of analysis.

- Duplicates are generally analysed at a frequency of 1 for every 10 samples. Australian Standard 4482.1 provides an acceptable range of the RPD values up to 50% for quality control samples, depending on the magnitude of results in comparison to the LOR.
- Analysis of laboratory duplicates showed 384 valid values and nil invalid values.

8.3.2 Laboratory Blanks

- The assessment of blank analysis results was conducted to determine the existence and magnitude of contamination resulting from laboratory activities.
- No contaminants were found within any of the blanks analysed by the laboratory resulting in 380 valid values and nil invalid values.

8.3.3 Laboratory Spikes and Surrogates

- Laboratory limits of approximately 70-130% for inorganics / metals and 60-140% for organics were used in order to validate matrix spikes and laboratory surrogate samples.
- Analysis of spikes and surrogates showed 129 valid values and nil invalid values.

8.3.4 Laboratory Control Samples

- Laboratory limit of approximately 70-130% for inorganics / metals and 60-140% for organics were used in order to validate laboratory control samples.
- Analysis of the laboratory control samples showed 269 valid values and 12 invalid values.

8.4 QA / QC Data Evaluation

The qualitative and quantitative descriptors, so called Data Quality Indicators (DQIs), were used in interpreting the degree of acceptability of the data acquired in the course of the investigation.

The principle DQIs are precision, accuracy, representativeness, comparability, and completeness referred to by the acronym PARCC. Precision and accuracy are quantitative measures, representativeness and comparability are qualitative, and completeness is a combination of both quantitative and qualitative measures. Table 16 below summarises the DQO reconciliation.

Table 16. Summary of DQO Reconciliation.

QA/QC Item	DQO Criteria	Valid Data	Invalid Data	Completeness	Conclusion
Laboratory duplicate samples	95%	384	0	100.00%	Acceptable
Laboratory blank samples	100%	380	0	100.00%	Acceptable
Laboratory spike/surrogate recoveries	95%	129	0	100.00%	Acceptable
Laboratory Control samples	95%	269	12	95.54%	Acceptable
Blind Replicate Samples	75%	149	2	98.66%	Acceptable
Split Replicate Samples	75%	132	1	99.24%	Acceptable
Rinsate Samples	<LOR	89	0	100.00%	Acceptable
Trip Blank Samples	95%	10	0	100.00%	Acceptable
Trip Spike (BTEX) Samples	75%	10	0	100.00%	Acceptable
Overall Completeness:	95%	1552	15	99.03%	Acceptable

Notes to Table 16

LOR – Limits of Reporting

A total of 15 ‘invalid’ values were recorded throughout the data quality assessment. ADE considers the ‘invalid’ results are likely attributed to the difficulties in obtaining a homogeneous sample from heterogenous matrices.

The ratio of the valid data to the total number of the analyses conducted in the QA/QC program yielded 99.30 %, thereby meeting the DQO criteria of 95% completeness.

9 Results and Discussion

9.1 Field Observations

At the time of the intrusive works, the Sites condition and environmental setting was consistent with that of the observations made during Stage I PSI which is summarised within Section 3.1.3 of this report.

9.1.1 Site Soil and Sub Soil Geology

A summary of the subsurface profile is presented in Table 17 below. This information has been sourced from both the Stage I PSI and the Geotechnical Investigation undertaken by ADE.

Table 17. Subsurface Profile.

Layer	Material Description	Depth of the Layer (m BGL)
Topsoil/ Hardstand ¹	Concrete Slab / Asphalt / Pavement / Grass	0.0 to 0.1m
Fill	Silty SAND	Below topsoil or soil surface to maximum depth of 1.1 m BGL (refer to <i>Appendix V – Borehole Logs</i> for more information)
Residual	Sandy CLAY / Silty CLAY / Silty SAND	Below fill to maximum depth of 4.1 m BGL (refer to <i>Appendix V – Borehole Logs</i> for more information)

Notes to Table 19

1 - Hardstand areas were located within specific areas across the Site (refer to *Appendix IV - Borehole Logs*).

At the time of the investigation, the virgin soil materials were consistent with the local geology and soil landscape for the area.

9.1.2 PID Field Screening

Soil samples were screened for the presence of VOCs using a PID. The PID readings reported negligible concentrations across the Site, which ranged from 0.0 ppm to 0.9 ppm. Refer to *Appendix II - Analytical Results Table* for PID Results.

9.2 Summary of Analytical Results

Soil analytical results from each sample collected during the course of the investigation are presented in *Appendix II - Analytical Results Table*.

9.2.1 Soil Suitability Assessment - Human Health

Of the 44 primary soil samples that were collected from the 22 borehole locations throughout the Site, all samples returned with concentrations well below that of the adopted human health assessment criteria for Tier 1 screening purposes for residential sites (HIL-B), public open space (HIL C) and commercial/industrial (HIL D) as outlined in the NEPM (*NEPC, 2013*) and the PFAS NEMP (*HEPA, 2020*).

9.2.2 Soil Suitability Assessment - Ecological Health

Of the 44 primary soil samples that were collected from the 22 borehole locations throughout the Site all meet the adopted ecological screening levels for fine grained soils as outlined in the NEPM (*NEPC, 2013*) with the following exceptions:

Elevated concentrations of Zinc exceed the adopted EIL criteria for Commercial/Industrial criteria in samples:

- DSI-BH18 (0.3-0.5)

Elevated concentrations of Benzo(a)pyrene exceed the adopted ESL criteria for Commercial/Industrial (fine Soil) criteria in samples:

- DSI-BH20 (0.2-0.4)

The locations of the above samples are not within the DSZ as indicated in Figure 2 of *Appendix I – Aerial Figures* and will be excavated as part of the construction of the underground carpark and poses little to no risk to ecological health. ADE is of the opinion that further investigation into this contamination is not deemed necessary.

9.2.3 Soil Chemical Characterisation – Preliminary Waste Classification - ENM Order 2014

Based on the analytical data collected throughout the course of the investigation, the concentrations of Heavy Metals, TRHs, PAHs, BTEX, and asbestos within the fill materials all meet the absolute maximum criteria assigned to Excavated Natural Material as per the NSW EPA (NSW EPA, 2014b) with the following exceptions:

Elevated concentrations of Lead exceed the Absolute Maximum criteria in samples:

- DSI-BH04 (0.2)
- DSI-BH09 (0.3-0.4)
- DSI-BH11 (0.3-0.4)
- DSI-BH14 (0.5-0.6)
- DSI-BH15 (0.2-0.3)
- DSI-BH18 (0.3-0.5)
- DSI-BH22 (0.2-0.4)

Elevated concentrations of Benzo(a)pyrene exceed the Absolute Maximum criteria in the sample:

- DSI-BH20 (0.2-0.4)

All samples listed here are located within the top 0.6 m of soil with all other fill material adhering to the absolute maximum and maximum average criteria as stated within the ENM order.

Excluding the above areas, all analyte concentrations in all other samples collected meet the Average Maximum as stated in the ENM order.

Electrical conductivity, pH and Foreign Materials were not analysed as not enough material could be collected from each sample depth.

NOTE: This in-situ preliminary waste classification should be used for indicative purposes only. Further sampling will be required should any material be removed from the initial sampling investigation area.

9.2.4 Soil Chemical Characterisation - Preliminary Waste Classification

Based on the analytical data collected throughout the course of the investigation, the concentrations of Heavy Metals, TCLP – Heavy Metals, TRHs, PAHs, BTEX, OCPs/OPPs, PCBs, PFAS and asbestos within the fill materials all meet the criteria assigned to General Solid Waste (non-putrescible) as per the NSW EPA (NSW EPA, 2014a; 2016) with the following exceptions:

Elevated concentrations of Heavy metals exceed the CT1 criteria in the samples:

- DSI-BH04 (0.2)
- DSI-BH09 (0.3-0.4)
- DSI-BH11 (0.3-0.4)
- DSI-BH14 (0.5-0.6)
- DSI-BH15 (0.2-0.3)
- DSI-BH18 (0.3-0.5)
- DSI-BH22 (0.2-0.4)

All of the above samples were further analysed for TCLP Heavy metals and received a result less than the TCLP 1 criterion for General Solid Waste.

Elevated concentrations of Benzo(a)pyrene exceed the CT1 criteria in the sample:

- DSI-BH20 (0.2-0.4)

The PAH concentrations within the fill materials stated above meet the CT2 criteria assigned to Restricted Solid Waste (non-putrescible) as per the NSW EPA (NSW EPA, 2014a; 2016).

Furthermore, the concentrations detected for all other analytes were below CT1 within the soil samples collected. As such, it is at the discretion of the client to determine whether the materials from these locations are acceptable as recyclable within the specific licensing requirements of the receiving landfill.

Coffey (2018) noted that “A preliminary waste classification assessment was carried out on the samples collected with approximately half of the fill material samples classifying as Restricted Solid Waste due to lead exceedances. Following TCLP testing on four of the higher lead concentration samples (HA12_0.0-0.1, HA18_0.0-0.1, HA21_0.5-0.6 & HA22_0.5-0.6), classification was reduced to General Solid Waste as there was low leachability of lead within the soils.”

NOTE: This in-situ preliminary waste classification should be used for indicative purposes only. Further sampling may be required should any material be removed from outside the initial sampling investigation area.

9.2.5 Soil Chemical Characterisation – Virgin Excavated Natural Material assessment

Based on the analytical data collected throughout the course of the investigation, the concentrations of Heavy Metals, TRHs, PAHs, BTEX, OCPs/OPPs, PCBs, PFAS within the natural materials underlying fill material all meet the criteria assigned to Virgin Excavated Natural Material (VENM) as per the POEO Act (1997).

9.2.6 Asbestos Assessment

In total, twelve (12) 65 g soil samples were collected throughout the course of the investigation and analysed in accordance with AS4964-2004. Following the subsequent analysis, no asbestos was recorded within any of the samples analysed (refer to *Appendix V - Chain of Custody Documentation and Analytical Reports*).

Due to the known presence of asbestos within existing structures, adopted sampling methodology and site history, further assessment and inspection will be required to assess the soils suitability to remain onsite in accordance with the proposed land-use. Should the soils be elected to be re-used onsite, a further sampling regime will need to be completed in accordance with the NEPM (*NEPC, 2013*) and the Western Australia Department of Health (WA DoH) Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, May 2009 (WA DoH, 2009).

9.3 Site Characterisation

In summary, based on the findings of this investigation and in consideration of the key conclusions outlined above, ADE considers that the Site can be made suitable for the ongoing Arncliffe Eden Property development provided the surface soils surrounding BH20 and BH18 is excavated along with the construction of the carpark and, following addressing the recommendations outlined within this report.

9.4 Duty to Report Contamination

For the purposes of section 60(3)(b) of the CLM Act, notification of contamination in, or on, soil on the land is required where:

- The 95 % UCL on the arithmetic average concentration of a contaminant in or on soil is equal to or above the HIL and/or HSL for that contaminant for the current or approved use of the respective on-site land, as specified in Section 6, Schedule B1 of the NEPM (2013); or
- The concentration of a contaminant in an individual soil sample is equal to or more than 250% of the HIL and/or HSL for that contaminant for the current or approved use of the respective on-site land, as specified in Section 6, Schedule B1 of the NEPM (2013); and
- A person has been or foreseeably will be exposed to the contaminant or a by-product of the contaminant.

ADE considers that the client does not have a duty to report contamination to the NSW EPA regarding on-site contamination of soils due to concentrations of the analysed analytes being below that of the adopted SAC. Due to the adopted sampling methodology, a quantitative asbestos assessment for asbestos in soil was unable to undertaken and is therefore considered necessary in the event that the soil materials are proposed to be retained or beneficially re-used within the Site boundaries.

With the exception of the asbestos assessment, the surrounding area did not detect any contamination and it is the opinion of ADE that exposure to the contaminants is unlikely due to their locality (private property), and moderate, however unlikely exposure pathways.

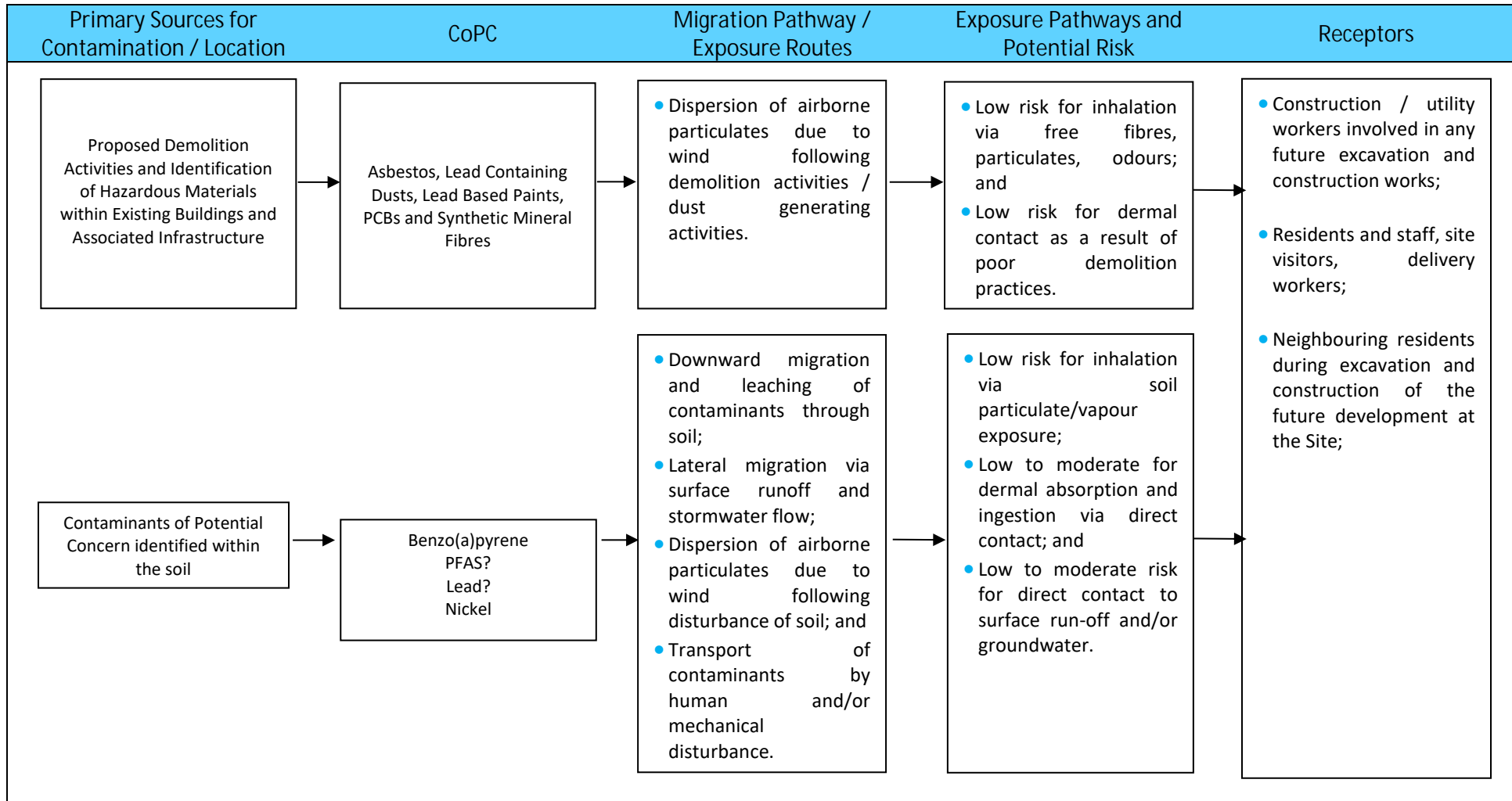
10 Conceptual Site Model

10.1 Potential Contamination Sources and Hazards

The Conceptual Site Model (CSM) in accordance with Section 4, Conceptual Site Models, in Schedule B2 NEPM (2013) has been developed based on the findings of the current investigation. Given the previous identification of hazardous materials including but not limited to; asbestos, lead, PCBs and SMF and the proposed development, ADE has kept these items as potential sources of contamination within the CSM.

The findings of the Stage II DSI have been used to develop a CSM, thereby assessing the potential for exposure to Site personnel and associated impacts on the proposed construction and long-term future land use exposure scenarios at the Site, as shown in Figure 2 on the following page.

Figure 2. Conceptual Site Model for the Site.



10.2 Groundwater Assessment

The water table was identified within the sandstone bedrock layer, between 2 and 5 m BGL. Based on the data summarised within this report and the absence of contamination sources both offsite and onsite, further assessment for potential groundwater contamination was not deemed required.

11 Conclusions and Recommendations

Based on the data and evidence collected from the Stage II DSI the following conclusions can be made:

11.1 Soil Contamination Assessment

- At the time of the inspection, the Site's condition and environmental setting were consistent with the observations made during the Stage I PSI (Reditus, 2019);
- No aesthetic related issues or visual contamination were identified during the course of the investigation;
- The sub-surface profile generally consists of the following;
 - Topsoil - in between 0.0 - 0.1 m BGL;
 - Fill - in between 0.0 – 0.8 m BGL; and
 - Residual sediments - below fill to 2.0 m BGL.
- All field PID readings returned negligible concentrations in between 0.0 - 0.9 ppm;
- Of the 44 primary soil samples analysed, no exceedances were recorded against any of the adopted human health and ecological SAC with the exception of DSI-BH20 (0.2-0.4) and DSI-BH18 (0.3-0.5);
- DSI-BH20 (0.2-0.4) exceeds the adopted ESL Commercial/Industrial land use for Benzo(a)pyrene.
- DSI-BH18 (0.3-0.5) exceeds the adopted EIL Commercial/Industrial land use for Zinc.
- DSI-BH20 and DSI-BH18 are not located within the DSZ and are not considered an issue to the Arncliffe Eden Property Development as the area will be excavated for the construction of the underground carpark.

11.2 Preliminary Waste Classification

- The chemical concentrations of Heavy Metals, TRHs, PAHs, PFAS and asbestos within the fill materials all meet the Absolute Maximum and Maximum Average criteria assigned to Excavated Natural Material as per the NSW EPA (NSW EPA, 2014a) with the exceptions of:
 - DSI-BH04 (0.2)
 - DSI-BH09 (0.3-0.4)
 - DSI-BH11 (0.3-0.4)
 - DSI-BH14 (0.5-0.6)
 - DSI-BH15 (0.2-0.3)
 - DSI-BH18 (0.3-0.5)
 - DSI-BH20 (0.2-0.4)
 - DSI-BH22 (0.2-0.4)
- The chemical concentrations of Heavy Metals, TRHs, PAHs, BTEX, OCPs/OPPs, PCBs, PFAS and asbestos within the fill materials all meet the CT1 criteria assigned to General Solid Waste (non-putrescible) as per the NSW EPA (NSW EPA, 2014b; 2016) with the exception of:
 - DSI-BH20 (0.2-0.4)
- The chemical concentrations of Heavy Metals, TRHs, PAHs, BTEX, OCPs/OPPs, PCBs, PFAS and asbestos within the fill materials surrounding BH20 meet the CT2 criteria assigned to Restricted Solid Waste (non-putrescible) as per the NSW EPA (NSW EPA, 2014b; 2016);

- The chemical concentrations of Heavy Metals, TRHs, BTEX, PAHs, OCPs, OPPS, PCBs and PFAS within the underlying virgin soil materials all meet the definition and adopted SAC assigned to VENM as per the POEO Act (1997);
- No asbestos was detected within any of the eighteen (18) soil samples analysed or the one (1) fibre cement sample collected; and
- A quantitative asbestos assessment is required to be undertaken in accordance with the NEPM (NEPC, 2013) and the Western Australia Department of Health Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia (WA DoH, 2009) if soils are proposed to be retained or beneficially re-used within the Site boundaries.

11.3 Recommendations

Following a review of the information presented within the Stage I PSI (Reditus, 2019) and the conclusions of this investigation, ADE recommends that the following are undertaken to ensure the Site is suitable for the proposed development;

- Complete an intrusive hazardous materials survey of all structures subject to demolition with all identified hazardous materials recorded and maintained on an up-to-date register and subsequently removed by a SafeWork Licenced Asbestos Assessor and / or appropriately licensed removalist prior to any demolition activities;
- Care should be taken when conducting a waste classification surrounding BH20 and PAH TCLP analysis should be included within the suite of analysis;
- Due to the close proximity of sensitive receptors, it is recommended that a CEMP is developed to ensure the proposed construction works will be managed to avoid or mitigate potential environmental or nuisance impacts. The CEMP should include but not be limited to environmental controls, vibration and acoustics, site and emergency contact information, corrective action policies, procedural review standards and the development of an UFP; and
- Following demolition, further in situ sampling of the site in accordance with the sampling design guidelines as stated in NSW EPA 1995 and referenced in the NSW ENM order of 2014 with the inclusion of pH, EC and NSW RTA T276 Foreign materials analysis with the delineation sampling surrounding the sample points as listed above.

11.4 Suitability of Site

Taking into consideration the data obtained from both previous and current investigations, ADE considers that the Site can be made suitable for the proposed RACF development, with no requirement for a Stage III RAP.

12 Limitations and Disclaimer

This report has been prepared for the exclusive use of the client and is limited to the scope of the work agreed in the terms and conditions of contract (including assumptions, limitations and qualifications, circumstances, and constraints). ADE has relied upon the accuracy of information and data provided to it by the client and others.

ADE has used a degree of care and skill ordinarily exercised in similar investigations by reputable members of the environmental industry in Australia. No other warranty, expressed or implied, is made or intended. No one section or part of a section, of this report should be taken as giving an overall idea of this report. Each section must be read in conjunction with the whole of this report, including its appendixes and attachments. The report is an integral document and must be read in its entirety.

To the fullest extent permitted by law, ADE does not accept or assume responsibility to any third party (other than the client) for the investigative work, the report or the opinions given.

The scope of work conducted, and report herein may not meet the specific needs (of which ADE is not aware) of third parties. ADE cannot be held liable for third party reliance on this document. Any third party who relies upon this report does so at its own risk.

The subsurface environment can present substantial uncertainty due to its complex heterogeneity. The conclusions presented in this report are based on limited investigation of conditions at specific sampling locations chosen to be as representative as possible under the given circumstances. However, it is possible that this investigation may not have encountered all areas of contamination at the site due to the limited sampling and testing program undertaken.

The material subject to classification pertains only to the site and subject area outlined within the report and must be consistent with the waste description reported. If there are any unexpected finds that are not consistent with this classification, ADE must be notified immediately.

ADE does not verify the accuracy or completeness of, or adopt as its own, the information or data supplied by others and excludes all liability with respect to such information and data. To the extent that conditions differ from assumptions set out in the report, and to the extent that information provided to ADE is inaccurate or incomplete or has changed since it was provided to ADE, the opinions expressed in this report may not be valid and should be reviewed.

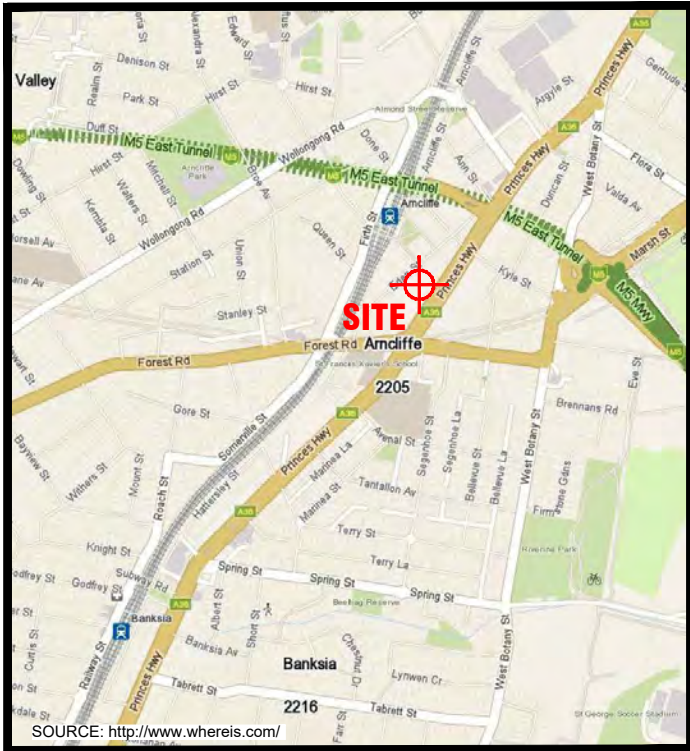
ADE's professional opinions are based upon its professional judgement, experience, training, and results from analytical data. In some cases, further testing and analysis may be required, thus producing different results and/or opinions. ADE has limited its investigation to the scope agreed upon with its client.

This Limitation and Disclaimer must accompany every copy of this report.

13 References

- Australian Standard AS 4482.1 Guide to the sampling and investigation of potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds
- Australian Standard AS 4482.2 Guide to the sampling and investigation of potentially contaminated soil. Part 1: volatiles substances
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- Guidance for the Preparation of Standard Operating Procedures for Quality-Related Documents (EPA QA/G-6)
- Guidance for Data Quality Assessment: Practical Methods for Data Analysis (EPA QA/G-9)
- Guidance on Data Quality Indicators, EPA QA/G-5I
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- Work Health and Safety Act 2011
- Work Health and Safety Regulation 2017

APPENDIX I - FIGURES



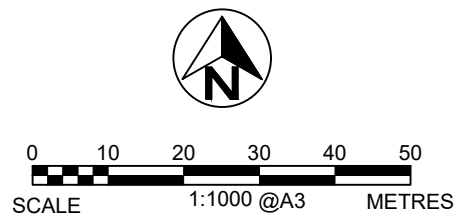
LEGEND

- - - APPROXIMATE SITE BOUNDARY
- ◆ BH BORE HOLE LOCATION

NOTE:
ALL LOCATIONS ARE APPROXIMATE
DIMENSIONS IN METRES.

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM, 07 DEC 2020.

no.	description	drawn	approved	date
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B	ADD RSW	MC	MP	16/06/21



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approved	MP	project:	PHASE II, DETAILED SITE INVESTIGATION 26-42 EDEN STREET, ARNCLIFFE, NSW		
date	16/06/2021	title:	SAMPLE LOCATIONS AND SITE LOCATION PLAN		
scale	AS SHOWN	project no:	STC-2151-18730_DSI2	figure no:	FIGURE 1
original size	A3	rev:	B		

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PLOT DATE: 16/06/2021 12:55:46 PM DWG FILE: W:\STC - SHORT TERM CLIENT\STC-2151-18730 BILLBERGIA (ARNCLIFFE)\27.11.2020 ML1 - WORKING DOCUMENTS\4-CAD (MC)\STC-2151-18730_DSI2_REV01.DWG



LEGEND

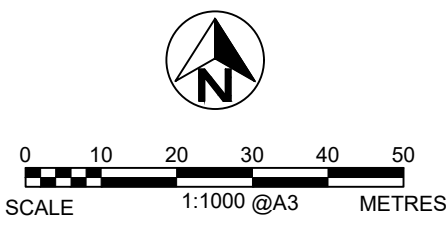
- APPROXIMATE SITE BOUNDARY
- + BORE HOLE LOCATION
- DEEP SOIL ZONES

SAMPLE ID	DEPTH (metres)
CHEMICAL	CONCENTRATION (mg/kg)
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	NEPM 2013 1B(3) 'EIL URBAN RESIDENTIAL AND PUBLIC OPEN SPACE' AND EIL COMMERCIAL AND INDUSTRIAL' EXCEEDANCE

NOTE:
ALL LOCATIONS ARE APPROXIMATE
DIMENSIONS IN METRES.

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM, 07 DEC 2020.

no.	description	drawn	approved	date
A	FIRST ISSUE	MC	MP	17/12/20
B	ADD RSW	MC	MP	16/06/21



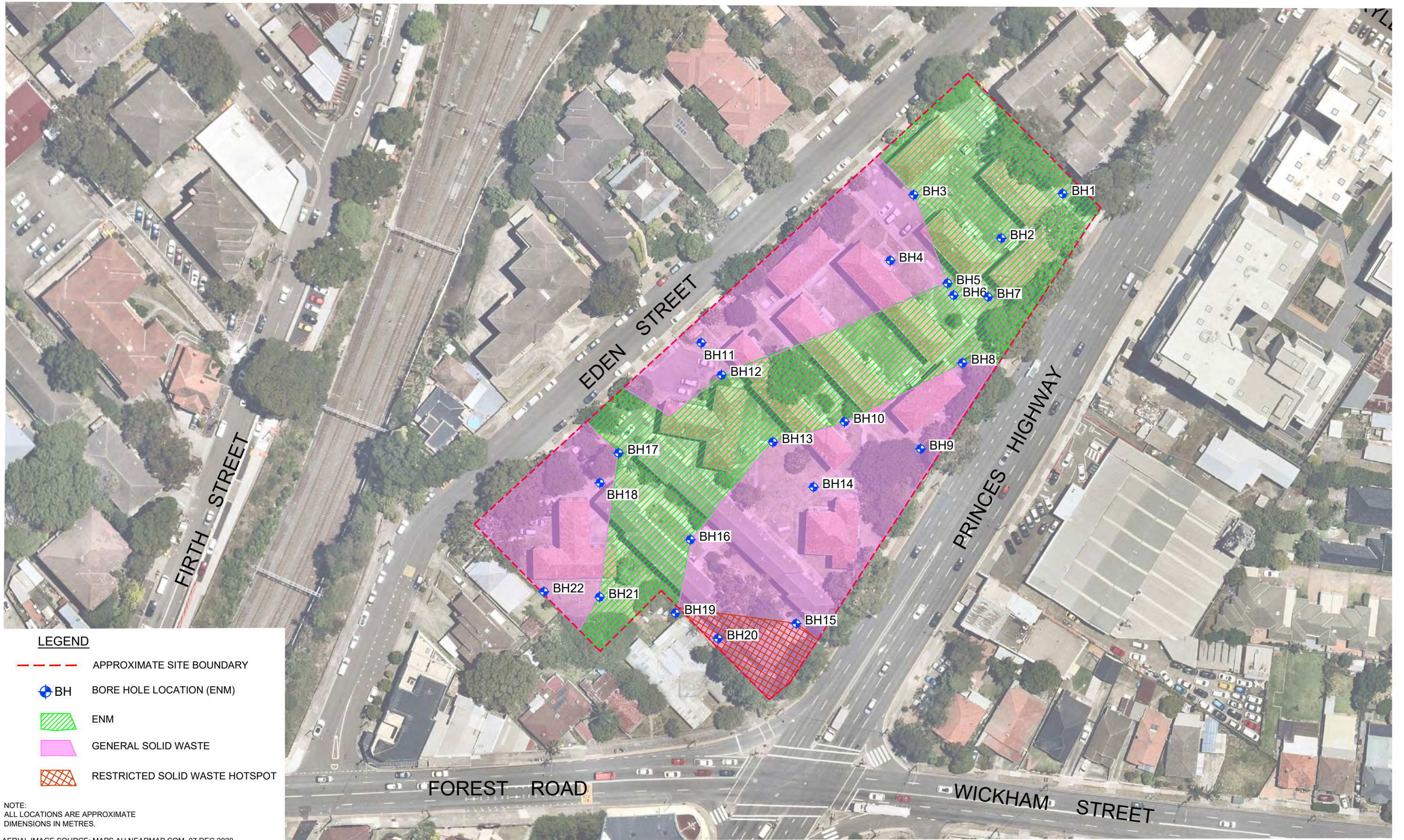
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approved	MP	project:	PHASE II, DETAILED SITE INVESTIGATION 26-42 EDEN STREET, ARNCLIFFE, NSW	
date	16/06/2021	title:	SOIL EXCEEDANCES	
scale	AS SHOWN	project no:	STC-2151-18730_DSI2	figure no: FIGURE 2
original size	A3	rev:	B	



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PLOT DATE: 16/06/2021 12:55:29 PM DWG FILE: W:\STC - SHORT TERM CLIENTS\STC-2151-18730\BILLBERGIA (ARNCLIFFE)\27.11.2020 ML1 - WORKING DOCUMENTS\4-CAD (MC)\STC-2151-18730_DSI2_REV08.DWG

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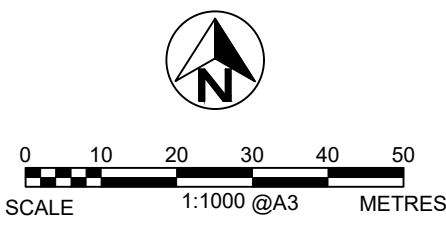
LEGEND

- - - APPROXIMATE SITE BOUNDARY
- + BH BORE HOLE LOCATION (ENM)
- ▨ ENM
- GENERAL SOLID WASTE
- ▨ RESTRICTED SOLID WASTE HOTSPOT

NOTE:
ALL LOCATIONS ARE APPROXIMATE
DIMENSIONS IN METRES.

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM, 07 DEC 2020.

no.	description	drawn	approved	date
A	FIRST ISSUE	MC	MP	17/12/20
B	ADD RSW	MC	MP	16/06/21



drawn	MC	client:	ARNCLIFFE EDEN PROPERTY PTY LTD	
approved	MP	project:	PHASE II, DETAILED SITE INVESTIGATION 26-42 EDEN STREET, ARNCLIFFE, NSW	
date	16/06/2021	title:	EXCAVATED NATURAL MATERIAL AND GENERAL SOLID WASTE AREAS	
scale	AS SHOWN	project no:	STC-2151-18730_DSI2	figure no: FIGURE 3
original size	A3	rev:	B	



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PLOT DATE: 16/06/2021 12:56:10 PM DWG FILE: W:\STC - SHORT TERM CLIENT\STC-2151-18730\BILLBERGIA (ARNCLIFFE)\27.11.2020 ML1 - WORKING DOCUMENTS\4-CAO (MC)\STC-2151-18730_DSI2_REV08.DWG



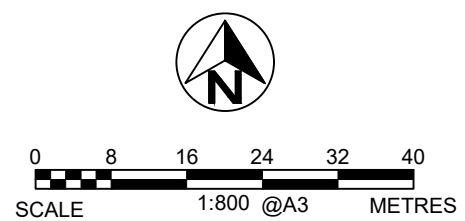
LEGEND

- - - APPROXIMATE SITE BOUNDARY
- SUBJECT AREA HIL B - EIL / ESL URBAN RES
- SUBJECT AREA HIL C - EIL / ESL COMM / IN
- SUBJECT AREA HIL C - EIL / ESL URBAN RES
- SUBJECT AREA HIL D - EIL / ESL COMM / IN

NOTE:
ALL LOCATIONS ARE APPROXIMATE
DIMENSIONS IN METRES.

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM, 07 DEC 2020.

no.	description	drawn	approved	date
A	FIRST ISSUE	MC	MP	17/12/20
B	ADD RSW	MC	MP	16/06/21



drawn	MC	client:	ARNCLIFFE EDEN PROPERTY PTY LTD		
approved	MP	project:	PHASE II, DETAILED SITE INVESTIGATION 26-42 EDEN STREET, ARNCLIFFE, NSW		
date	16/06/2021	title:	SAC BOUNDARIES		
scale	AS SHOWN	project no:	STC-2151-18730_DSI2	figure no:	FIGURE 4
original size	A3	rev:	B		

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APPENDIX II – ANALYTICAL RESULTS TABLE

Results Table 1

Eden St Arnccliffe Phase II Detailed Site Investigation Materials Results Table	BTEX							TRH					Halogenated Benzenes	Inorganics	
	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene total	Total BTEX	<E-C10 Fraction (F1)	<E-C10 (F1 minus BTEX)	>C10-C16 Fraction (F2)	<C16-C34 Fraction (F3)	<C34-C40 Fraction (F4)	>C10-C40 Fraction (Sum)	Hexachlorobenzene	Moisture Content
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%
EOL	0.5	0.5	1	2	1			35	35	50	100	100			
NSW 2014 Excavated Natural Material (Absolute Max)	0.5	65	25			15									
NSW 2014 Excavated Natural Material (Max Average)															
NSW 2014 General Solid Waste CT1 (No Leaching)	10	288	600			1,000									
NSW 2014 General Solid Waste SCC1 (with leached)	18	518	1,080			1,800									
NSW 2014 Restricted Solid Waste SCC2 (with leached)	72	2,073	4,320			7,200									
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind															
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space															
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil	95	135	185			95		215	170	2,500	6,600				
NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil	65	105	125			45		180	120	1,300	5,600				
NEPM 2013 Table 1A(1) Hills Res A Soil													10		
NEPM 2013 Table 1A(1) Hills Res B Soil													15		
NEPM 2013 Table 1A(1) Hills Rec C Soil													10		
NEPM 2013 Table 1A(1) Hills Comm/Ind D Soil													80		
NEPM 2020 HILs for Residential B															
NEPM 2020 HILs for Recreational C															
NEPM 2020 HILs for Commercial/Industrial D															
NEPM 2020 Ecological Indirect Exposure															

Field ID	Date	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene total	Total BTEX	<E-C10 Fraction (F1)	<E-C10 (F1 minus BTEX)	>C10-C16 Fraction (F2)	<C16-C34 Fraction (F3)	<C34-C40 Fraction (F4)	>C10-C40 Fraction (Sum)	Hexachlorobenzene	Moisture Content
DSI-BH1(0.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	4
DSI-BH1(0.5)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	3.1
DSI-BH1(1.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	6.7
DSI-BH2(0.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	3.1
DSI-BH2(0.9)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	6.8
DSI-BH3(0.9)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	12.4
DSI-BH3(1.4)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	11.8
DSI-BH4(0.2)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	7.8
DSI-BH4(0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	11.8
DSI-BH5(0.5)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	3.3
DSI-BH5(0.9)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	7.2
DSI-BH6(0.5-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	20.1
DSI-BH6(1.0-1.1)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	12
DSI-BH7(0.2-0.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	3.9
DSI-BH7(0.5-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	6.1
DSI-BH8(0.2-0.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	3.7
DSI-BH8(0.8-0.9)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	3.8
DSI-BH9(0.3-0.4)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	5.4
DSI-BH9(0.5-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	5.3
DSI-BH10(0.5-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	7.4
DSI-BH10(0.7-0.9)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	6.6
DSI-BH11(0.3-0.4)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	11.5
DSI-BH11(0.5-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	3
DSI-BH12(0.7-1.0)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	4.5
DSI-BH12(1.1-1.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	10.9
DSI-BH13(0.5-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	7.6
DSI-BH13(1.1-1.2)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	14.7
DSI-BH14(0.5-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	9.6
DSI-BH14(0.9-1.0)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	9.1
DSI-BH15(0.2-0.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	3.9
DSI-BH15(0.6-0.8)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	6.8
DSI-BH16(0.3-0.4)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	4.4
DSI-BH17(0.1-0.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	4.7
DSI-BH17(0.5-0.8)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	3.1
DSI-BH18(0.3-0.5)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	5.1
DSI-BH18(1.5-1.7)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	13.7
DSI-BH19(0.2-0.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	5.2
DSI-BH19(0.9-1.0)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	16.5
DSI-BH20(0.2-0.4)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	6.7
DSI-BH20(0.4-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	6.6
DSI-BH21(0.2-0.4)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	7.7
DSI-BH21(0.7-0.8)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	9.4
DSI-BH22(0.2-0.4)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	6.7
DSI-BH22(0.4-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	9.5

Statistics																
Maximum Concentration	<0.5	<0.5	<1	<2	<1	0	0	0	<35	<35	<50	<100	<100	0	<0.1	20.1
Maximum Detect	ND	ND	ND	ND	ND	0	0	0	ND	ND	ND	ND	ND	0	ND	20.1
Average Concentration *	0.25	0.25	0.5	1	0.5	0	0	0	18	18	25	50	50	0	0.05	7.8
95% UCL (Student's-t) *	0.25	0.25	0.5	1	0.5	0	0	0	17.5	17.5	25	50	50	0	0.05	8.855

* A Non Detect Multiplier of 0.5 has been applied.
 NT - Not tested

Environmental Standards
 NSW EPA, November 2014, NSW 2014 Excavated Natural Material (Absolute Max)
 NSW EPA, November 2014, NSW 2014 Excavated Natural Material (Max Average)
 NSW EPA, November 2014, NSW 2014 General Solid Waste CT1 (No Leaching)
 NSW EPA, November 2014, NSW 2014 General Solid Waste SCC1 (with leached)
 NSW EPA, November 2014, NSW 2014 Restricted Solid Waste SCC2 (with leached)
 2013, NEPM 2013 Table 1A(1) Hills Res A Soil
 2013, NEPM 2013 Table 1A(1) Hills Res B Soil
 2013, NEPM 2013 Table 1A(1) Hills Rec C Soil
 2013, NEPM 2013 Table 1A(1) Hills Comm/Ind D Soil
 2020, NEMP 2020 HILs for Residential B
 2020, NEMP 2020 HILs for Recreational C
 2020, NEMP 2020 HILs for Commercial/Industrial D
 2020, NEMP 2020 Ecological Indirect Exposure

Results Table 1

Eden St Arnclyffe Phase II Detailed Site Investigation Materials Results Table

Field ID	Date	Organophosphorous Pesticides						PAH																					
		Chlorpyrifos	Chlorpyrifos-methyl	Diazinon	Ethoprop	Methyl parathion	Roanet	Acenaphthene	Acenaphthylene	Anthracene	Benzo[a]anthracene	Benzo[e]pyrene	Benzo[b]fluoranthene	Benzo[k]fluoranthene	Benzo[a]pyrene	Benzo[ghi]perylene	Benzo[a]fluoranthene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene	Fluorene	Indeno[1,2,3-c,d]pyrene	Naphthalene	Phenanthrene	Pyrene	Benzo[a]pyrene TEQ Calc (Half)	Benzo[a]pyrene TEQ (LOR)	Benzo[a]pyrene TEQ Calc (Zero)	PAHs (Sum of positives)
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
NSW 2014 Excavated Natural Material (Absolute Max)																													
NSW 2014 Excavated Natural Material (Max Average)																													
NSW 2014 General Solid Waste CT1 (No Leaching)																													
NSW 2014 General Solid Waste SCC1 (with leached)																													
NSW 2014 Restricted Solid Waste SCC2 (with leached)																													
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind																													
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space																													
NEPM 2013 Table 1B(6) ESIs for Comm/Ind, Fine Soil														1.4															
NEPM 2013 Table 1B(6) ESIs for Urban Res, Fine Soil														0.7															
NEPM 2013 Table 1A(1) HILs Res A Soil																													
NEPM 2013 Table 1A(1) HILs Res B Soil																													
NEPM 2013 Table 1A(1) HILs Rec C Soil																													
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil																													
NEMP 2020 HILs for Residential B																													
NEMP 2020 HILs for Recreational C																													
NEMP 2020 HILs for Commercial/Industrial D																													
NEMP 2020 Ecological Indirect Exposure																													

DSI-BH1(0.3)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.38	0.36	0.73	0	0.73
DSI-BH1(0.5)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.38	0.36	0.73	0	0
DSI-BH1(1.3)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.38	0.36	0.73	0	0
DSI-BH2(0.3)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.61	0.62	0.82	0.42	1.96
DSI-BH2(0.9)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	
DSI-BH3(0.9)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	
DSI-BH3(1.4)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	
DSI-BH4(0.2)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	
DSI-BH4(0.6)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	
DSI-BH5(0.5)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.51	0.61	0.81	0.41	1.74
DSI-BH5(0.9)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	
DSI-BH6(0.5-0.6)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	
DSI-BH6(1.0-1.1)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	
DSI-BH7(0.2-0.3)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	
DSI-BH7(0.5-0.6)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	
DSI-BH8(0.2-0.3)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	
DSI-BH8(0.8-0.9)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	
DSI-BH9(0.3-0.4)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	
DSI-BH9(0.5-0.6)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	
DSI-BH10(0.5-0.6)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	
DSI-BH10(0.7-0.9)	3/12/2020	<0.10																																

Results Table 1
Eden St Arncliffe Phase II Detailed Site Investigation Materials Results Table

	PCBs							Pesticides	TPH					PFAS		
	Arochlor 1016	Arochlor 1221	Arochlor 1222	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	DEF	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C16 Fraction (Sum)	Sum of PFOS & PFOAs	PFOA	PFOS
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.1	25	50	100	100				
NSW 2014 Excavated Natural Material (Absolute Max)													500			
NSW 2014 Excavated Natural Material (Max Average)													250			
NSW 2014 General Solid Waste CT1 (No Leaching)									650				10,000			
NSW 2014 General Solid Waste SCC1 (with leached)									650				10,000			
NSW 2014 Restricted Solid Waste SCC2 (with leached)									2,600				40,000			
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind																
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space																
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil																
NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil																
NEPM 2013 Table 1A(1) HILs Res A Soil																
NEPM 2013 Table 1A(1) HILs Res B Soil																
NEPM 2013 Table 1A(1) HILs Rec C Soil																
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil																
NEMP 2020 HILs for Residential B														2	20	
NEMP 2020 HILs for Recreational C														1	10	
NEMP 2020 HILs for Commercial/Industrial D														20	50	
NEMP 2020 Ecological Indirect Exposure																0.01

Field ID	Date	Arochlor 1016	Arochlor 1221	Arochlor 1222	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	DEF	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C16 Fraction (Sum)	Sum of PFOS & PFOAs	PFOA	PFOS
DSI-BH1(0.3)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	NT	NT	NT
DSI-BH1(0.5)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	<0.001	<0.001	<0.001
DSI-BH1(1.3)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	NT	NT	NT
DSI-BH2(0.3)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	0.003	0.001	0.003
DSI-BH2(0.9)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	NT	NT	NT
DSI-BH3(0.9)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	<0.001	<0.001	<0.001
DSI-BH3(1.4)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	NT	NT	NT
DSI-BH4(0.2)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	0.008	<0.001	0.008
DSI-BH4(0.6)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	NT	NT	NT
DSI-BH5(0.5)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	0.004	0.001	0.004
DSI-BH5(0.9)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	NT	NT	NT
DSI-BH6(0.5-0.6)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	NT	NT	NT
DSI-BH6(1.0-1.1)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	<0.001	<0.001	<0.001
DSI-BH7(0.2-0.3)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	NT	NT	NT
DSI-BH7(0.5-0.6)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	<0.001	<0.001	<0.001
DSI-BH8(0.2-0.3)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	0.001	<0.001	0.001
DSI-BH8(0.8-0.9)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	NT	NT	NT
DSI-BH9(0.3-0.4)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	<0.001	<0.001	<0.001
DSI-BH9(0.5-0.6)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	NT	NT	NT
DSI-BH10(0.5-0.6)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	NT	NT	NT
DSI-BH10(0.7-0.9)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	<0.001	<0.001	<0.001
DSI-BH11(0.3-0.4)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	0.002	<0.001	0.002
DSI-BH11(0.5-0.6)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	NT	NT	NT
DSI-BH12(0.7-1.0)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	<0.001	<0.001	<0.001
DSI-BH12(1.1-1.3)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	NT	NT	NT
DSI-BH13(0.5-0.6)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	<0.001	<0.001	<0.001
DSI-BH13(1.1-1.2)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	NT	NT	NT
DSI-BH14(0.5-0.6)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	<0.001	<0.001	<0.001
DSI-BH14(0.9-1.0)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	NT	NT	NT
DSI-BH15(0.2-0.3)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	<0.001	<0.001	<0.001
DSI-BH15(0.6-0.8)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	NT	NT	NT
DSI-BH16(0.3-0.4)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	0.005	<0.001	0.005
DSI-BH17(0.1-0.3)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	NT	NT	NT
DSI-BH17(0.5-0.8)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	<0.001	<0.001	<0.001
DSI-BH18(0.3-0.5)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	0.011	0.001	0.011
DSI-BH18(1.5-1.7)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	NT	NT	NT
DSI-BH19(0.2-0.3)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	<0.001	<0.001	<0.001
DSI-BH19(0.9-1.0)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	NT	NT	NT
DSI-BH20(0.2-0.4)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	0.003	<0.001	0.003
DSI-BH20(0.4-0.6)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	NT	NT	NT
DSI-BH21(0.2-0.4)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	<0.001	<0.001	<0.001
DSI-BH21(0.7-0.8)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	NT	NT	NT
DSI-BH22(0.2-0.4)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	0.004	0.003	0.004
DSI-BH22(0.4-0.6)	3/12/2020	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	NT	NT	NT

Statistics	Arochlor 1016	Arochlor 1221	Arochlor 1222
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Results Table 2

**Eden St Arnccliffe Phase II Detailed Site
Investigation Fill Materials Results
Table**

	BTEX							TRH					Halogenated Benzene	Inorganics	Metals										
	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Total BTEX	<C6-C10 Fraction (F1)	<C6-C10 (F1 minus BTEX)	>C10-C16 Fraction (F2)	>C16-C24 Fraction (F3)	>C24-C40 Fraction (F4)			>C40-C60 Fraction (F5)	Hexachlorobenzene	Moisture Content	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	TCLP Lead	Mercury	Nickel	Zinc
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg
EQI	0.5	0.5	1	2	1			35	35	50	100	100		0.1		5	0.3	5	5	10	0.5	0.2	10	5	
NSW 2014 Excavated Natural Material (Absolute Max)	0.5	65	25			15										40	1	150	200	100		1	60	300	
NSW 2014 Excavated Natural Material (Max Average)																20	0.5	75	100	50		0.5	30	150	
NSW 2014 General Solid Waste CT1 (No Leaching)	10	288	600			1,000										100	20		100			4	40		
NSW 2014 General Solid Waste SCC1 (with leached)	18	518	1,080			1,800										500	100		1,500			50	1,050		
NSW 2014 Restricted Solid Waste CT2 (No Leaching)	40	1,152	2,400			4,000										400	80		400			16	160		
NSW 2014 Restricted Solid Waste SCC2 (with leached)	72	2,073	4,320			7,200										2,000	400		6,000			200	4,200		
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind																160		311	145.3	1800			65	166	
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space																100		191	100.3	1100			40	116	
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil	95	135	185			95			215	170	2,500	6,600													
NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil	65	105	125			45			180	120	1,300	5,600													
NEPM 2013 Table 1A(1) HILs Res B Soil													15		500	150		30,000	1,200			120	1,200	60,000	
NEPM 2013 Table 1A(1) HILs Rec C Soil													10		300	90		17,000	600			80	1,200	30,000	
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil													80		3,000	900		240,000	1,500			730	6,000	400,000	

Field ID	Date																										
DSI-BH1(0.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	4	<5.0	<0.30	<5.0	27.6	38.1	-	<0.20	<10.0	61.1		
DSI-BH1(0.5)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	3.1	<5.0	<0.30	<5.0	<10.0	<10.0	-	<0.20	<10.0	<5.0		
DSI-BH2(0.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	6.1	<5.0	<0.30	<5.0	80.6	52.2	-	<0.20	<10.0	62.1		
DSI-BH2(0.9)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	3.8	<5.0	<0.30	7.8	<5.0	<10.0	-	<0.20	<10.0	<5.0		
DSI-BH3(0.9)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	12.4	<5.0	<0.30	13.9	<5.0	<10.0	-	<0.20	<10.0	<5.0		
DSI-BH4(0.2)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	7.8	<5.0	<0.30	5.7	28.1	102.4	<0.5	<0.20	<10.0	73		
DSI-BH4(0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	11.8	<5.0	<0.30	14.3	<5.0	<10.0	-	<0.20	<10.0	<5.0		
DSI-BH5(0.5)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	3.3	<5.0	<0.30	5.4	46.4	77.7	-	<0.20	<10.0	98.9		
DSI-BH5(0.9)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	7.2	<5.0	<0.30	<5.0	<10.0	<10.0	-	<0.20	<10.0	<5.0		
DSI-BH6(0.5-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	20.1	<5.0	<0.30	<5.0	19.9	50.3	-	<0.20	<10.0	54.4		
DSI-BH7(0.2-0.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	3.9	<5.0	<0.30	5	23.3	51.4	-	<0.20	<10.0	51.8		
DSI-BH7(0.5-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	6.1	<5.0	<0.30	7.9	<5.0	<10.0	-	<0.20	<10.0	<5.0		
DSI-BH8(0.2-0.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	3.7	<5.0	<0.30	8.1	6.2	11	-	<0.20	<10.0	13.5		
DSI-BH8(0.8-0.9)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	3.8	<5.0	<0.30	7.1	<5.0	<10.0	-	<0.20	<10.0	<5.0		
DSI-BH9(0.3-0.4)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	5.4	<5.0	<0.30	9.3	46.6	133.1	<0.5	<0.20	20	104.9		
DSI-BH10(0.5-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	7.4	<5.0	<0.30	5.9	<5.0	<10.0	-	<0.20	<10.0	13.3		
DSI-BH11(0.3-0.4)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	11.5	<5.0	<0.30	6.3	19.2	349.3	<0.5	<0.20	<10.0	75.9		
DSI-BH11(0.5-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	3	<5.0	<0.30	<5.0	<10.0	<10.0	-	<0.20	<10.0	10.9		
DSI-BH13(0.5-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	7.6	<5.0	<0.30	8.7	<5.0	<10.0	-	<0.20	<10.0	5.6		
DSI-BH14(0.5-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	9.6	20.4	<0.30	<5.0	6.7	112.8	<0.5	<0.20	<10.0	38.1		
DSI-BH15(0.2-0.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	3.9	5.2	<0.30	7.8	27.7	239.4	<0.5	<0.20	<10.0	108.5		
DSI-BH16(0.3-0.4)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	4.4	<5.0	<0.30	<5.0	15.1	90.8	-	<0.20	<10.0	96.2		
DSI-BH17(0.1-0.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	4.7	<5.0	<0.30	7.9	13.3	93.3	-	<0.20	<10.0	57.9		
DSI-BH18(0.3-0.5)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	5.1	<5.0	0.32	8.3	60.7	188.3	<0.5	<0.20	<10.0	177.1		
DSI-BH19(0.2-0.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	5.2	<5.0	<0.30	9.3	32.5	66.5	-	<0.20	26.6	144.2		
DSI-BH20(0.2-0.4)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	6.7	<5.0	<0.30	17.8	21.7	84.6	-	<0.20	19	98.3		
DSI-BH21(0.2-0.4)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	7.7	<5.0	<0.30	<5.0	<5.0	38.2	-	<0.20	<10.0	98.6		
DSI-BH22(0.2-0.4)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	6.7	8.3	<0.30	7	14.7	114.3	<0.5	<0.20	<10.0	76.2		

Statistics																											
Maximum Concentration	<0.5	<0.5	<1	<2	<1	0	0	<35	<35	<50	<100	<100	0	<0.1	20.1	20.4	0.32	17.8	80.6	349.3	<0.5	0.47	26.6	177.1			
Average Concentration *	0.5	0.5	1	2	1	0	0	35	35	50	100	100	0	0.1	6.6	5.7	0.3	7.4	19	71	0.5	0.21	11	56			
Standard Deviation *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.8	3	0.0038	3.2	19	80	0	0.051					

Results Table 2

Eden St Arncliffe Phase II Detailed Site Investigation Fill Materials Results Table

Table with 40 columns (17 PAHs, 7 PCBs, 5 Pesticides, 5 TPH fractions) and 17 rows (EQI, various NSW and NEPM standards, and NEPM Tables 1A(1) HILS Res B, C, and D Soil).

Main data table with columns for Field ID, Date, and 40 columns of pollutant concentrations (17 PAHs, 7 PCBs, 5 Pesticides, 5 TPH fractions) for 23 different field locations.

Summary statistics table with columns for Maximum Concentration, Average Concentration, Standard Deviation, and 95% UCL for each of the 40 pollutants.

* A Non Detect Multiplier of 1 has been applied.

Environmental Standards
NSW EPA, November 2014, NSW 2014 Excavated Nature
NSW EPA, November 2014, NSW 2014 Excavated Nature
NSW EPA, November 2014, NSW 2014 General Solid Wa
NSW EPA, November 2014, NSW 2014 General Solid Wa
NSW EPA, November 2014, NSW 2014 Restricted Solid V
NSW EPA, November 2014, NSW 2014 Restricted Solid V
2013, NEPM 2013 Table 1B(6) ESIs for Comm/Ind, Fine S
2013, NEPM 2013 Table 1B(6) ESIs for Urban Res, Fine S
2013, NEPM 2013 Table 1A(1) HILS Res B Soil
2013, NEPM 2013 Table 1A(1) HILS Rec C Soil
2013, NEPM 2013 Table 1A(1) HILS Comm/Ind D Soil

Results Table 3
Eden St Arncliffe Phase II Detailed Site Investigation ENM Materials Results Table

	BTEX							Inorganics	Metals							PAH		TPH						
	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Total BTEX		Moisture Content	Arsenic*	Calcium*	Chromium (III+VI)*	Copper*	Lead*	Mercury*	Nickel*	Zinc*	Benzo(a) pyrene*	PAHs (Sum of positives)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C16 Fraction (Sum)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.5	0.5	1	2	1				5	0.3	5	5	10	0.2	10	5	0.3		25	50	100	100		
NSW 2014 Excavated Natural Material (Absolute Max)	0.5	65	25			15			40	1	150	200	100	1	60	300	1							500
NSW 2014 Excavated Natural Material (Max Average)									20	0.5	75	100	50	0.5	30	150	0.5							250
NSW 2014 General Solid Waste CT1 (No Leaching)	10	288	600			1,000			100	20			100	4	40				650					10,000
NSW 2014 General Solid Waste SCC1 (with leached)	18	518	1,080			1,800			500	100			1,500	50	1,050				650					10,000
NSW 2014 Restricted Solid Waste CT2 (No Leaching)	40	1,152	2,400			4,000			400	80			400	16	160				2,600					40,000
NSW 2014 Restricted Solid Waste SCC2 (with leached)	72	2,073	4,320			7,200			2,000	400			6,000	200	4,200				2,600					40,000
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind									160		311	145.3	1800		65	166								
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space									100		191	100.3	1100		40	116								
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil	95	135	185			95											1.4							
NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil	65	105	125			45											0.7							
NEPM 2013 Table 1A(1) HILs Res B Soil									500	150		30,000	1,200	120	1,200	60,000								
NEPM 2013 Table 1A(1) HILs Rec C Soil									300	90		17,000	600	80	1,200	30,000								
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil									3,000	900		240,000	1,500	730	6,000	400,000								

Field ID	Date	0.5	0.5	1	2	1			5	0.3	5.0	5.0	10.0	0.2	10.0	5.0	0.3	0	25	50	100	100		
DSI-BH1(0.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	4	5	0.3	5.0	27.6	38.1	0.2	10.0	61.1	<0.30	0.73	<25	<50	<100	<100	0
DSI-BH1(0.5)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	3.1	5	0.3	5.0	5.0	10.0	0.2	10.0	5.0	<0.30	0	<25	<50	<100	<100	0
DSI-BH2(0.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	3.1	5	0.3	5.0	80.6	52.2	0.2	10.0	62.1	0.38	1.96	<25	<50	<100	<100	0
DSI-BH2(0.9)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	6.8	5	0.3	7.8	5.0	10.0	0.2	10.0	5.0	<0.30	0	<25	<50	<100	<100	0
DSI-BH3(0.9)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	12.4	5	0.3	13.9	5.0	10.0	0.2	10.0	5.0	<0.30	0	<25	<50	<100	<100	0
DSI-BH4(0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	11.8	5	0.3	14.3	5.0	10.0	0.2	10.0	5.0	<0.30	0	<25	<50	<100	<100	0
DSI-BH5(0.5)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	3.3	5	0.3	5.4	46.4	77.7	0.2	10.0	98.9	0.37	1.74	<25	<50	<100	<100	0
DSI-BH5(0.9)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	7.2	5	0.3	5.0	5.0	10.0	0.2	10.0	5.0	<0.30	0	<25	<50	<100	<100	0
DSI-BH6(0.5-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	20.1	5	0.3	5.0	19.9	50.3	0.2	10.0	54.4	<0.30	0	<25	<50	<100	<100	0
DSI-BH7(0.2-0.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	3.9	5	0.3	5.0	23.3	51.4	0.2	10.0	51.8	<0.30	0	<25	<50	<100	<100	0
DSI-BH7(0.5-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	6.1	5	0.3	7.9	5.0	10.0	0.2	10.0	5.0	<0.30	0	<25	<50	<100	<100	0
DSI-BH8(0.2-0.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	3.7	5	0.3	8.1	6.2	11.0	0.2	10.0	13.5	<0.30	0	<25	<50	<100	<100	0
DSI-BH8(0.8-0.9)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	3.8	5	0.3	7.1	5.0	10.0	0.2	10.0	5.0	<0.30	0	<25	<50	<100	<100	0
DSI-BH10(0.5-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	7.4	5	0.3	5.9	5.0	10.0	0.2	10.0	13.3	<0.30	0	<25	<50	<100	<100	0
DSI-BH11(0.5-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	3	5	0.3	5.0	5.0	10.0	0.2	10.0	10.9	<0.30	0	<25	<50	<100	<100	0
DSI-BH13(0.5-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	7.6	5	0.3	8.7	5.0	10.0	0.2	10.0	5.6	<0.30	0	<25	<50	<100	<100	0
DSI-BH16(0.3-0.4)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	4.4	5	0.3	5.0	15.1	90.8	0.2	10.0	96.2	<0.30	0	<25	<50	<100	<100	0
DSI-BH17(0.1-0.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	4.7	5	0.3	7.9	13.3	93.3	0.2	10.0	57.9	<0.30	0.65	<25	<50	<100	<100	0
DSI-BH19(0.2-0.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	5.2	5	0.3	9.3	32.5	66.5	0.2	26.6	144.2	<0.30	0	<25	<50	<100	<100	0
DSI-BH21(0.2-0.4)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	7.7	5	0.3	5.0	5.0	38.2	0.2	10.0	98.6	<0.30	0	<25	<50	<100	<100	0

Statistics	0.5	0.5	1	2	1	0	0	20.1	5	0.3	14.3	80.6	93.3	0.2	26.6	144.2	0.38	1.96	ND	ND	ND	ND	ND
Maximum Concentration	ND	ND	ND	ND	ND	ND	ND	20.1	5	0.3	14.3	80.6	93.3	0.2	26.6	144.2	0.38	1.96	ND	ND	ND	ND	ND
Average Concentration *	0.5	0.5	1	2	1	0	0	6	5	0	7	16	33	ND	11	40	0.36	1.2	25	50	100	100	0

* A Non Detect Multiplier of 1 has been applied.
ND - Not Detected

Environmental Standards

- NSW EPA, November 2014, NSW 2014 Excavated Natural Material (Absolute Max)
- NSW EPA, November 2014, NSW 2014 Excavated Natural Material (Max Average)
- NSW EPA, November 2014, NSW 2014 General Solid Waste CT1 (No Leaching)
- NSW EPA, November 2014, NSW 2014 General Solid Waste SCC1 (with leached)
- NSW EPA, November 2014, NSW 2014 Restricted Solid Waste CT2 (No Leaching)
- NSW EPA, November 2014, NSW 2014 Restricted Solid Waste SCC2 (with leached)
- 2013, NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil
- 2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil
- 2013, NEPM 2013 Table 1A(1) HILs Res B Soil
- 2013, NEPM 2013 Table 1A(1) HILs Rec C Soil
- 2013, NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil

Results Table 4

Eden St Arncliffe Phase II Detailed Site Investigation Natural Materials Results Table	BTEX							TRH						Halogenated Benzenes	Inorganics	Metals								
	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Total BTEX	C6-C10 Fraction (F1)	C6-C10 (F1 minus BTEX)	<C10-C16 Fraction (F2)	<C16-C34 Fraction (F3)	>C34-C60 Fraction (F4)	>C10-C60 Fraction (Sum)	Hexachlorobenzene	Moisture Content	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EQI	0.5	0.5	1	2	1			35	35	50	100	100		0.1		5	0.3	5	5	10	0.2	10	5	
NEPM 2013 Table 18(5) Generic EIL - Comm/Ind																160								
NEPM 2013 Table 18(5) Generic EIL - Urban Res & Public Open Space																100								
NEPM 2013 Table 1A(1) HILs Res B Soil														15		500	150		30,000	1,200	120	1,200	60,000	
NEPM 2013 Table 1A(1) HILs Rec C Soil														10		300	90		17,000	600	80	1,200	30,000	
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil														80		3,000	900		240,000	1,500	730	6,000	400,000	
Berkman (1989) Background Ranges	ND	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND			1-0.50	1	5-1000	2-100	2-200	0.03	5-500	10-300	
ANZECC (1992) Background Ranges	ND	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND			0.2-30	0.04-2	0.2-30	1-190	2-200	0.001-0.1	2-400	2-180	
Field ID	Date																							
DSI-BH1(1.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	6.7	<5.0	<0.30	8.4	<5.0	<10.0	<0.20	<10.0	<5.0
DSI-BH3(1.4)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	11.8	<5.0	<0.30	11.1	<5.0	<10.0	<0.20	<10.0	<5.0
DSI-BH6(1.0-1.1)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	12	<5.0	<0.30	7.6	<5.0	<10.0	<0.20	<10.0	<5.0
DSI-BH9(0.5-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	5.3	<5.0	<0.30	<5.0	<5.0	<10.0	<0.20	<10.0	<5.0
DSI-BH10(0.7-0.9)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	6.6	<5.0	<0.30	<5.0	<5.0	<10.0	<0.20	<10.0	11.2
DSI-BH12(0.7-1.0)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	4.5	<5.0	<0.30	6.8	<5.0	10.3	<0.20	<10.0	12.3
DSI-BH12(1.1-1.3)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	10.9	<5.0	<0.30	16.3	<5.0	<10.0	<0.20	<10.0	<5.0
DSI-BH13(1.1-1.2)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	14.7	<5.0	<0.30	8.6	<5.0	<10.0	<0.20	<10.0	<5.0
DSI-BH14(0.9-1.0)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	9.1	<5.0	<0.30	7	<5.0	<10.0	<0.20	<10.0	<5.0
DSI-BH15(0.6-0.8)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	6.8	<5.0	<0.30	<5.0	<5.0	<10.0	<0.20	<10.0	21.7
DSI-BH17(0.5-0.8)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	3.1	<5.0	<0.30	5.7	<5.0	<10.0	<0.20	<10.0	<5.0
DSI-BH18(1.5-1.7)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	13.7	<5.0	<0.30	21.3	<5.0	<10.0	<0.20	<10.0	<5.0
DSI-BH19(0.9-1.0)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	16.5	<5.0	<0.30	8.1	10.1	15.2	<0.20	<10.0	133.3
DSI-BH20(0.4-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	6.6	<5.0	<0.30	<5.0	<5.0	<10.0	<0.20	<10.0	14.7
DSI-BH21(0.7-0.8)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	9.4	<5.0	<0.30	<5.0	<5.0	<10.0	<0.20	<10.0	<5.0
DSI-BH22(0.4-0.6)	3/12/2020	<0.50	<0.50	<1.0	<2.0	<1.0	0	0	<35	<35	<50	<100	<100	0	<0.10	9.5	8.6	<0.30	33.6	<5.0	13.4	<0.20	<10.0	16.4
Statistics																								
Maximum Concentration		<0.5	<0.5	<1	<2	<1	0	0	<35	<35	<50	<100	<100	0	<0.1	16.5	8.6	<0.3	33.6	10.1	15.2	<0.2	<10	133.3
Average Concentration *		0.5	0.5	1	2	1	0	0	35	35	50	100	100	0	0.1	9.2	5.2	0.3	10	5.3	11	0.2	10	16
Standard Deviation *		0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.8	0.9	0	7.8	1.3	1.5	0	0	32
95% UCL (Student's-t) *		0.5	0.5	1	2	1	0	0	35	35	50	100	100	0	0.1	10.88	5.619	0.3	13.37	5.878	11.21	0.2	10	30.1

* A Non Detect Multiplier of 1 has been applied.

Environmental Standards
 2013, NEPM 2013 Table 1A(1) HILs Res B Soil
 2013, NEPM 2013 Table 1A(1) HILs Rec C Soil
 2013, NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil
 1989, Berkman Background Ranges
 1992, ANZECC Background Ranges

Results Table 4

Eden St Arnccliffe Phase II Detailed Site Investigation Natural Materials Results Table

	Organochlorine Pesticides																				Organophosphorous Pesticides						
	4,4-DDE	β-BHC	Aldrin	γ-BHC	Chlordane (cis)	Chlordane (trans)	δ-BHC	DDD	DDT	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	γ-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor	Chlorpyrifos	Chlorpyrifos-methyl	Diazinon	Ethionop	Methyl parathion	Ronnel	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EOL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
NEPM 2013 Table 18(5) Generic EIL - Comm/Ind									640																		
NEPM 2013 Table 18(5) Generic EIL - Urban Res & Public Open Space									180																		
NEPM 2013 Table 1A(1) HILs Res B Soil														20						500	340						
NEPM 2013 Table 1A(1) HILs Rec C Soil														20						400	250						
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil														100						2,500	2,000						
Berkman (1989) Background Ranges			ND		ND	ND		ND	ND	ND	ND	ND	ND														
ANZECC (1992) Background Ranges			ND		ND	ND		ND	ND	ND	ND	ND	ND														
Field ID	Date																										
DSI-BH1(1.3)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
DSI-BH3(1.4)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
DSI-BH6(1.0-1.1)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
DSI-BH9(0.5-0.6)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
DSI-BH10(0.7-0.9)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
DSI-BH12(0.7-1.0)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
DSI-BH12(1.1-1.3)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
DSI-BH13(1.1-1.2)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
DSI-BH14(0.9-1.0)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
DSI-BH15(0.6-0.8)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
DSI-BH17(0.5-0.8)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
DSI-BH18(1.5-1.7)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
DSI-BH19(0.9-1.0)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
DSI-BH20(0.4-0.6)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
DSI-BH21(0.7-0.8)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
DSI-BH22(0.4-0.6)	3/12/2020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Statistics																											
Maximum Concentration		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Average Concentration *		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Standard Deviation *		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
95% UCL (Student's-t) *		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	

* A Non Detect Multiplier of 1 has been applied.

Environmental Standards

- 2013, NEPM 2013 Table 1A(1) HILs Res B Soil
- 2013, NEPM 2013 Table 1A(1) HILs Rec C Soil
- 2013, NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil
- 1989, Berkman Background Ranges
- 1992, ANZECC Background Ranges

Results Table 4

Eden St Arndcliffe Phase II Detailed Site Investigation Natural Materials Results Table

	PAH																		PCBs							Pesticides	TPH							
	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Benzo(a)pyrene TEQ Calc (Hair)	Benzo(a)pyrene TEQ (LOR)	Benzo(a)pyrene TEQ Calc (Zero)	PAHs (Sum of positives)	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	DEF	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum)	
EQL	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.1	25	50	100	100			
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind																	370																	
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space																	170																	
NEPM 2013 Table 1A(1) HILs Res B Soil																																		
NEPM 2013 Table 1A(1) HILs Rec C Soil																																		
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil																																		
Berkman (1989) Background Ranges					ND												40	40	40	ND	ND	ND	ND	ND	ND	ND	ND							
ANZECC (1992) Background Ranges					ND															ND	ND	ND	ND	ND	ND	ND								
Field ID	Date																																	
DSI-BH1(1.3)	3/12/2020	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	
DSI-BH3(1.4)	3/12/2020	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	
DSI-BH6(1.0-1.1)	3/12/2020	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	
DSI-BH9(0.5-0.6)	3/12/2020	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	
DSI-BH10(0.7-0.9)	3/12/2020	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	
DSI-BH12(0.7-1.0)	3/12/2020	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	
DSI-BH12(1.1-1.3)	3/12/2020	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	
DSI-BH13(1.1-1.2)	3/12/2020	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	
DSI-BH14(0.9-1.0)	3/12/2020	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	
DSI-BH15(0.6-0.8)	3/12/2020	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	
DSI-BH17(0.5-0.8)	3/12/2020	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	
DSI-BH18(1.5-1.7)	3/12/2020	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	
DSI-BH19(0.9-1.0)	3/12/2020	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	
DSI-BH20(0.4-0.6)	3/12/2020	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	
DSI-BH21(0.7-0.8)	3/12/2020	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	
DSI-BH22(0.4-0.6)	3/12/2020	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.36	0.73	0	0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.10	<25	<50	<100	<100	0	
Statistics																																		
Maximum Concentration		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.36	0.73	0	0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<25	<50	<100	<100	0	
Average Concentration *		0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.36	0.73	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.1	25	50	100	100	0	
Standard Deviation *		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
95% UCL (Student's-t) *		0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.36	0.73	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.1	25	50	100	100	0	

* A Non Detect Multiplier of 1 has been applied.

- Environmental Standards
- 2013, NEPM 2013 Table 1A(1) HILs Res B Soil
- 2013, NEPM 2013 Table 1A(1) HILs Rec C Soil
- 2013, NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil
- 1989, Berkman Background Ranges
- 1992, ANZECC Background Ranges

APPENDIX III - PHOTOGRAPHS



Photograph 1. Blocks 8, 7, 6 and communal gardens of the northern portion of the subject site (facing north east). Date: 01.12.2020.



Photograph 2. Walkway between blocks 5 and 10 of the southern portion of the subject site (facing north east). Date: 01.12.2020.



Photograph 3. Communal garden and washing lines south-east of block 11 within the southern portion of the subject site. Date: 01.12.2020.



Photograph 4. Drill rig setup and work zone delineation area. Date: 30.12.2020.



Photograph 5. Soil profile depicting the fill / natural matrices encountered within BH2 (0.0-2.0 m). Date: 30.11.2020.



Photograph 6. Soil profile depicting the fill / natural matrices encountered within BH11 (0.0-2.0 m). Date: 30.11.2020.



Photograph 7. Soil profile depicting the fill / natural matrices encountered within BH21 (0.0-0.8 m). Date: 01.12.2020.



Photograph 8. Soil profile depicting the fill / natural matrices encountered within BH13 (0.0-0.8 m). Date: 30.11.2020.

APPENDIX IV - BOREHOLE LOGS



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 NSW 2128
 Telephone: 1300796922

BOREHOLE NUMBER BH1

CLIENT Arncliffe Eden Property Pty Ltd PROJECT NAME Detailed Site Investigation
 PROJECT NUMBER STC-2125-18730 PROJECT LOCATION 24-46 Eden Street, Arncliffe NSW

DATE STARTED 30/11/2020 COMPLETED 30/11/2020 R.L. SURFACE 0 DATUM m -
 DRILLING CONTRACTOR Epoca SLOPE 90° BEARING na
 EQUIPMENT Geoprobe 7822DT CO-ORDINATES E 328898.04 N 6243198.1
 HOLE SIZE 50mm LOGGED BY NK CHECKED BY MP

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture Content	Consistency	PID (ppm)	Samples Tests Remarks	Additional Observations
						TOPSOIL					
						FILL: SAND, fine to coarse grained, well graded, medium to light brown, dry.	D		0.2	BH1 0.3	
		-0.5	0.5						0.1	BH1 0.5	
					SC	Clayey SAND: fine to coarse grained, well graded, medium orange, dry.	D		0	BH1 0.8	
		-1.0	1.0							BH1 1.3	
		-1.5	1.5								
		-2.0	2.0			BH1 terminated at 2m					
		-2.5	2.5								
		-3.0	3.0								

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 Telephone: 1300796922

BOREHOLE NUMBER BH2

CLIENT Arncliffe Eden Property Pty Ltd PROJECT NAME Detailed Site Investigation

PROJECT NUMBER STC-2125-18730 PROJECT LOCATION 24-46 Eden Street, Arncliffe NSW

DATE STARTED 30/11/2020 COMPLETED 30/11/2020 R.L. SURFACE 0 DATUM m -

DRILLING CONTRACTOR Epoca SLOPE 90° BEARING na

EQUIPMENT Geoprobe 7822DT CO-ORDINATES E 328878.69 N 6243199.52

HOLE SIZE 50mm LOGGED BY NK CHECKED BY MP

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture Content	Consistency	PID (ppm)	Samples Tests Remarks	Additional Observations
						TOPSOIL					Foreign materials such as charcoal, plastic and glass were observed
						FILL: SAND, fine to coarse grained, well graded, medium to light brown, dry.	D		0.2	BH2 0.3	
		-0.5	0.5						0.1	BH2 0.5	
		-1.0	1.0		SC	Clayey SAND: fine to coarse grained, well graded, light brown, moist.	M		0.4	BH2 0.9	
		-1.5	1.5						0.1	BH2 1.4	
		-2.0	2.0			BH2 terminated at 2m					
		-2.5	2.5								
		-3.0	3.0								

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 Telephone: 1300796922

BOREHOLE NUMBER BH3

CLIENT Arncliffe Eden Property Pty Ltd PROJECT NAME Detailed Site Investigation
 PROJECT NUMBER STC-2125-18730 PROJECT LOCATION 24-46 Eden Street, Arncliffe NSW

DATE STARTED 30/11/2020 COMPLETED 30/11/2020 R.L. SURFACE 0 DATUM m -
 DRILLING CONTRACTOR Epoca SLOPE 90° BEARING na
 EQUIPMENT Geoprobe 7822DT CO-ORDINATES E 328854.06 N 6243211.72
 HOLE SIZE 50mm LOGGED BY NK CHECKED BY MP

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture Content	Consistency	PID (ppm)	Samples Tests Remarks	Additional Observations
						TOPSOIL					
						FILL: Silty SAND, fine to medium grained, medium graded, dark brown, dry.	D		0.4	BH3 0.3	
		-0.5	0.5			FILL: SAND, medium grained, poorly graded, medium grey, moist.	M		0	BH3 0.5	
		-1.0	1.0		CL	Sandy CLAY: low plasticity, light brown mottled black, MC = PL.			0.2	BH3 0.9	
		-1.5	1.5						0.4	BH3 1.4	
		-2.0	2.0			BH3 terminated at 2m					
		-2.5	2.5								
		-3.0	3.0								

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BOREHOLE NUMBER BH5

CLIENT Arncliffe Eden Property Pty Ltd PROJECT NAME Detailed Site Investigation

PROJECT NUMBER STC-2125-18730 PROJECT LOCATION 24-46 Eden Street, Arncliffe NSW

DATE STARTED 30/11/2020 COMPLETED 30/11/2020 R.L. SURFACE 0 DATUM m -

DRILLING CONTRACTOR Epoca SLOPE 90° BEARING na

EQUIPMENT Geoprobe 7822DT CO-ORDINATES E 328863.57 N 6243186.83

HOLE SIZE 50mm LOGGED BY NK CHECKED BY MP

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture Content	Consistency	PID (ppm)	Samples Tests Remarks	Additional Observations
						TOPSOIL					
						FILL: Silty SAND, fine to medium grained, medium graded, dark brown, dry.	D		0	BH5 0.3	
		-0.5	0.5			FILL: Sandy SILT, low plasticity, dark grey, MC < PL.			0.1	BH5 0.5	
						FILL: SAND, fine to medium grained, poorly graded, light brown, with gravels, moist.	M		0.1	BH5 0.9	
		-1.0	1.0		CL	Sandy CLAY: low plasticity, light brown mottled black, MC = PL.			0	BH5 1.4	
		-1.5	1.5								
					SP	Gravelly SAND: coarse grained, poorly graded, medium grey and red, wet.	W				
						BH5 terminated at 1.8m					
		-2.0	2.0								
		-2.5	2.5								
		-3.0	3.0								

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BOREHOLE NUMBER BH6

CLIENT Arncliffe Eden Property Pty Ltd PROJECT NAME Detailed Site Investigation
 PROJECT NUMBER STC-2125-18730 PROJECT LOCATION 24-46 Eden Street, Arncliffe NSW

DATE STARTED 30/11/2020 COMPLETED 30/11/2020 R.L. SURFACE 0 DATUM m -
 DRILLING CONTRACTOR Epoca SLOPE 90° BEARING na
 EQUIPMENT Geoprobe 7822DT CO-ORDINATES E 328865.29 N 6243183.42
 HOLE SIZE 50mm LOGGED BY NK CHECKED BY MP

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture Content	Consistency	PID (ppm)	Samples Tests Remarks	Additional Observations
						TOPSOIL FILL: Silty SAND, fine to medium grained, medium graded, dark brown, dry.	D		0.1	BH6 0.3-0.4	Foreign materials, concrete was observed
		-0.5	0.5						0.1	BH6 0.5-0.6	
		-1.0	1.0		CL	Sandy CLAY: low plasticity, light brown mottled black, MC = PL.			0.1	BH6 1-1.1	
		-1.5	1.5								
		-2.0	2.0		SP	Gravelly SAND: coarse grained, poorly graded, medium grey and red, wet.	W		0.2	BH6 1.8-2	
						BH6 terminated at 2m					
		-2.5	2.5								
		-3.0	3.0								

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CLIENT Arncliffe Eden Property Pty Ltd PROJECT NAME Detailed Site Investigation

PROJECT NUMBER STC-2125-18730 PROJECT LOCATION 24-46 Eden Street, Arncliffe NSW

DATE STARTED 30/11/2020 COMPLETED 30/11/2020 R.L. SURFACE 0 DATUM m -

DRILLING CONTRACTOR Epoca SLOPE 90° BEARING na

EQUIPMENT Geoprobe 7822DT CO-ORDINATES E 328872.81 N 6243181.89

HOLE SIZE 50mm LOGGED BY NK CHECKED BY MP

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture Content	Consistency	PID (ppm)	Samples Tests Remarks	Additional Observations
						TOPSOIL FILL: Sandy SILT, low plasticity, medium brown, MC < PL.			0	BH7 0.2-0.3	
		-0.5	0.5						0.8	BH7 0.5-0.6	
					CL	Sandy CLAY: low plasticity, light brown mottled black, MC < PL.			0.8	BH7 0.7-0.8	
		-1.0	1.0						0.4	BH7 1.2-1.3	
		-1.5	1.5		SP	Gravelly SAND: coarse grained, poorly graded, medium grey and red, moist.	M				
					SP	SAND: medium grained, poorly graded, light grey, moist.	M				
		-2.0	2.0			BH7 terminated at 2m					
		-2.5	2.5								
		-3.0	3.0								



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BOREHOLE NUMBER BH8

CLIENT Arncliffe Eden Property Pty Ltd PROJECT NAME Detailed Site Investigation

PROJECT NUMBER STC-2125-18730 PROJECT LOCATION 24-46 Eden Street, Arncliffe NSW

DATE STARTED 30/11/2020 COMPLETED 30/11/2020 R.L. SURFACE 0 DATUM m -

DRILLING CONTRACTOR Epoca SLOPE 90° BEARING na

EQUIPMENT Geoprobe 7822DT CO-ORDINATES E 328867.76 N 6243164.38

HOLE SIZE 50mm LOGGED BY NK CHECKED BY MP

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture Content	Consistency	PID (ppm)	Samples Tests Remarks	Additional Observations
						TOPSOIL					
						FILL: Sandy SILT, low plasticity, medium brown, MC < PL.			0	BH8 0.2-0.3	
		-0.5	0.5						0	BH8 0.5-0.6	
									0.2	BH8 0.8-0.9	
		-1.0	1.0		CL	Sandy CLAY: low plasticity, light brown mottled black, MC < PL.					
					SP	SAND: medium grained, poorly graded, light orange and light brown, moist.	M				
										BH8 1.2-1.3	
						BH8 terminated at 1.3m					
		-1.5	1.5								
		-2.0	2.0								
		-2.5	2.5								
		-3.0	3.0								



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BOREHOLE NUMBER BH9

CLIENT Arncliffe Eden Property Pty Ltd PROJECT NAME Detailed Site Investigation

PROJECT NUMBER STC-2125-18730 PROJECT LOCATION 24-46 Eden Street, Arncliffe NSW

DATE STARTED 30/11/2020 COMPLETED 30/11/2020 R.L. SURFACE 0 DATUM m -

DRILLING CONTRACTOR Epoca SLOPE 90° BEARING na

EQUIPMENT Geoprobe 7822DT CO-ORDINATES E 328855.99 N 6243140.21

HOLE SIZE 50mm LOGGED BY NK CHECKED BY MP

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture Content	Consistency	PID (ppm)	Samples Tests Remarks	Additional Observations
						TOPSOIL					
						FILL: Gravelly SAND, coarse grained, well graded, dark grey, dry.	D		0		
					SP	SAND: medium grained, poorly graded, light grey, moist.	M		0.1	BH9 0.3-0.4	
		-0.5	0.5							BH9 0.5-0.6	
									0	BH9 0.7-0.8	
		-1.0	1.0			BH9 terminated at 0.8m					
		-1.5	1.5								
		-2.0	2.0								
		-2.5	2.5								
		-3.0	3.0								



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BOREHOLE NUMBER BH10

CLIENT Arncliffe Eden Property Pty Ltd PROJECT NAME Detailed Site Investigation

PROJECT NUMBER STC-2125-18730 PROJECT LOCATION 24-46 Eden Street, Arncliffe NSW

DATE STARTED 30/11/2020 COMPLETED 30/11/2020 R.L. SURFACE 0 DATUM m -

DRILLING CONTRACTOR Epoca SLOPE 90° BEARING na

EQUIPMENT Geoprobe 7822DT CO-ORDINATES E 328834.59 N 6243147.81

HOLE SIZE 50mm LOGGED BY NK CHECKED BY MP

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture Content	Consistency	PID (ppm)	Samples Tests Remarks	Additional Observations
						TOPSOIL					
						FILL: Sandy SILT, low plasticity, dark brown, MC < PL.			0.2	BH10 0.3-0.4	
		-0.5	0.5			FILL: SAND, fine to medium grained, well graded, light brown, moist.	M		0.1	BH10 0.5-0.6	
					SW	Gravelly SAND: fine to medium grained, well graded, dark purple, wet.	W		0.1	BH10 0.7-0.9	
		-1.0	1.0			BH10 terminated at 0.9m					
		-1.5	1.5								
		-2.0	2.0								
		-2.5	2.5								
		-3.0	3.0								



CLIENT Arncliffe Eden Property Pty Ltd PROJECT NAME Detailed Site Investigation
PROJECT NUMBER STC-2125-18730 PROJECT LOCATION 24-46 Eden Street, Arncliffe NSW

DATE STARTED 30/11/2020 COMPLETED 30/11/2020 R.L. SURFACE 0 DATUM m -
DRILLING CONTRACTOR Epoca SLOPE 90° BEARING na
EQUIPMENT Geoprobe 7822DT CO-ORDINATES E 328794.24 N 6243170.04
HOLE SIZE 50mm LOGGED BY NK CHECKED BY MP

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture Content	Consistency	PID (ppm)	Samples Tests Remarks	Additional Observations
						TOPSOIL					
						FILL: Sandy SILT, low plasticity, dark brown, MC < PL.			0	BH11 0.2-0.3	
		-0.5	0.5			FILL: SAND, fine to medium grained, well graded, light brown, moist.	M		0	BH11 0.5-0.6	
									1	BH11 0.8-0.9	
		-1.0	1.0		CL	Sandy CLAY: low plasticity, medium orange to red, MC = PL.			0	BH11 1.3-1.4	
		-1.5	1.5								
		-2.0	2.0			BH11 terminated at 2m					
		-2.5	2.5								
		-3.0	3.0								



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BOREHOLE NUMBER BH12

CLIENT Arncliffe Eden Property Pty Ltd PROJECT NAME Detailed Site Investigation

PROJECT NUMBER STC-2125-18730 PROJECT LOCATION 24-46 Eden Street, Arncliffe NSW

DATE STARTED 30/11/2020 COMPLETED 30/11/2020 R.L. SURFACE 0 DATUM m -

DRILLING CONTRACTOR Epoca SLOPE 90° BEARING na

EQUIPMENT Geoprobe 7822DT CO-ORDINATES E 328795.07 N 6243170.61

HOLE SIZE 50mm LOGGED BY NK CHECKED BY MP

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture Content	Consistency	PID (ppm)	Samples Tests Remarks	Additional Observations
						TOPSOIL					
						FILL: Sandy SILT, low plasticity, dark brown, MC < PL.			0	BH12 0.2-0.3	
		-0.5	0.5						0	BH12 0.5-0.6	
					SW	SAND: fine to medium grained, well graded, light brown, moist.	M		0	BH12 0.7-1	
		-1.0	1.0								
					CL	CLAY: medium plasticity, medium orange to red, with sand, MC = PL.				BH12 1.1-1.3	
		-1.5	1.5								
		-2.0	2.0			BH12 terminated at 2m					
		-2.5	2.5								
		-3.0	3.0								

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BOREHOLE NUMBER BH13

CLIENT Arncliffe Eden Property Pty Ltd PROJECT NAME Detailed Site Investigation

PROJECT NUMBER STC-2125-18730 PROJECT LOCATION 24-46 Eden Street, Arncliffe NSW

DATE STARTED 30/11/2020 COMPLETED 30/11/2020 R.L. SURFACE 0 DATUM m -

DRILLING CONTRACTOR Epoca SLOPE 90° BEARING na

EQUIPMENT Geoprobe 7822DT CO-ORDINATES E 328814.44 N 6243142.12

HOLE SIZE 50mm LOGGED BY NK CHECKED BY MP

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture Content	Consistency	PID (ppm)	Samples Tests Remarks	Additional Observations
						TOPSOIL FILL: Sandy SILT, low plasticity, dark brown, MC < PL.			0	BH13 0.2-0.3	
		-0.5	0.5						0	BH13 0.5-0.6	
					SW	SAND: fine to medium grained, well graded, light brown, moist.	M				
		-1.0	1.0		SC	Clayey SAND: fine to coarse grained, well graded, light orange to light grey, moist.	M		0	BH13 1.1-1.2	
		-1.5	1.5			BH13 terminated at 1.5m					
		-2.0	2.0								
		-2.5	2.5								
		-3.0	3.0								



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BOREHOLE NUMBER BH14

CLIENT Arncliffe Eden Property Pty Ltd PROJECT NAME Detailed Site Investigation

PROJECT NUMBER STC-2125-18730 PROJECT LOCATION 24-46 Eden Street, Arncliffe NSW

DATE STARTED 30/11/2020 COMPLETED 30/11/2020 R.L. SURFACE 0 DATUM m -

DRILLING CONTRACTOR Epoca SLOPE 90° BEARING na

EQUIPMENT Geoprobe 7822DT CO-ORDINATES E 328825.86 N 6243129.46

HOLE SIZE 50mm LOGGED BY NK CHECKED BY MP

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture Content	Consistency	PID (ppm)	Samples Tests Remarks	Additional Observations
						TOPSOIL					
						FILL: Silty SAND, fine to medium grained, medium graded, dark brown, dry.	D		0	BH14 0.3-0.4	
		-0.5	0.5						0	BH14 0.5-0.6	
						FILL: Sandy CLAY, low plasticity, light brown mottled black, MC = PL.			0	BH14 0.7-0.8	
		-1.0	1.0		SP	SAND: medium grained, poorly graded, light grey, moist.	M		0	BH14 0.9-1	
						BH14 terminated at 1m					
		-1.5	1.5								
		-2.0	2.0								
		-2.5	2.5								
		-3.0	3.0								



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 NSW 2128
 Telephone: 1300796922

BOREHOLE NUMBER BH15

CLIENT Arncliffe Eden Property Pty Ltd PROJECT NAME Detailed Site Investigation

PROJECT NUMBER STC-2125-18730 PROJECT LOCATION 24-46 Eden Street, Arncliffe NSW

DATE STARTED 1/12/2020 COMPLETED 1/12/2020 R.L. SURFACE 0 DATUM m -

DRILLING CONTRACTOR Epoca SLOPE 90° BEARING na

EQUIPMENT Geoprobe 7822DT CO-ORDINATES E 328819.87 N 6243133.56

HOLE SIZE 50mm LOGGED BY JP CHECKED BY MP

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture Content	Consistency	PID (ppm)	Samples Tests Remarks	Additional Observations
						TOPSOIL					
						FILL: Sandy SILT, low plasticity, dark brown, MC < PL.					Foreign materials, brick was observed
										BH15 0.2-0.3	
					SP	SAND: fine to medium grained, well graded, light brown, dry.	D				
			-0.5	0.5						BH15 0.4-0.6	
					SW	Gravelly SAND: fine to medium grained, well graded, dark purple, moist.	M			BH15 0.6-0.8	
						BH15 terminated at 0.8m					
			-1.0	1.0							
			-1.5	1.5							
			-2.0	2.0							
			-2.5	2.5							
			-3.0	3.0							



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BOREHOLE NUMBER BH16

CLIENT Arncliffe Eden Property Pty Ltd PROJECT NAME Detailed Site Investigation

PROJECT NUMBER STC-2125-18730 PROJECT LOCATION 24-46 Eden Street, Arncliffe NSW

DATE STARTED 1/12/2020 COMPLETED 1/12/2020 R.L. SURFACE 0 DATUM m -

DRILLING CONTRACTOR Epoca SLOPE 90° BEARING na

EQUIPMENT Geoprobe 7822DT CO-ORDINATES E 328791.18 N 6243114.63

HOLE SIZE 50mm LOGGED BY JP CHECKED BY MP

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture Content	Consistency	PID (ppm)	Samples Tests Remarks	Additional Observations
						TOPSOIL					
						FILL: Sandy SILT, low plasticity, dark brown, MC < PL.			0.9		Tree roots encountered at depth of 0.4 m BGL; High content of organic matters was observed.
						BH16 terminated at 0.4m				BH16 0.3-0.4	
		-0.5	0.5								
		-1.0	1.0								
		-1.5	1.5								
		-2.0	2.0								
		-2.5	2.5								
		-3.0	3.0								



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BOREHOLE NUMBER BH17

CLIENT Arncliffe Eden Property Pty Ltd PROJECT NAME Detailed Site Investigation
 PROJECT NUMBER STC-2125-18730 PROJECT LOCATION 24-46 Eden Street, Arncliffe NSW

DATE STARTED 1/12/2020 COMPLETED 1/12/2020 R.L. SURFACE 0 DATUM m -
 DRILLING CONTRACTOR Epoca SLOPE 90° BEARING na
 EQUIPMENT Geoprobe 7822DT CO-ORDINATES E 328772.55 N 6243132.38
 HOLE SIZE 50mm LOGGED BY JP CHECKED BY MP

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture Content	Consistency	PID (ppm)	Samples Tests Remarks	Additional Observations
						TOPSOIL					
						FILL: Sandy SILT, low plasticity, dark brown, MC < PL.				BH17 0.1-0.3	
										BH17 0.3-0.5	
		-0.5	0.5		SM	Silty SAND: fine grained, poorly graded, dark brown, moist.	M			BH17 0.5-0.8	
		-1.0	1.0		SM	Silty SAND: fine grained, poorly graded, brown, moist.	M				
		-1.5	1.5		CL	Sandy CLAY: medium plasticity, pale grey, MC = PL.				BH17 1.3-1.5	
					SP	SAND: medium grained, poorly graded, orange, moist.	M				
		-2.0	2.0			BH17 terminated at 2m					
		-2.5	2.5								
		-3.0	3.0								

ADE_BOREHOLE / TESTPIT STS-2151-18730.GPJ STC-2209-19098-AREA A.GPJ 16/6/21



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BOREHOLE NUMBER BH18

CLIENT Arncliffe Eden Property Pty Ltd PROJECT NAME Detailed Site Investigation
 PROJECT NUMBER STC-2125-18730 PROJECT LOCATION 24-46 Eden Street, Arncliffe NSW

DATE STARTED 1/12/2020 COMPLETED 1/12/2020 R.L. SURFACE 0 DATUM m -
 DRILLING CONTRACTOR Epoca SLOPE 90° BEARING na
 EQUIPMENT Geoprobe 7822DT CO-ORDINATES E 328765.74 N 6243130.59
 HOLE SIZE 50mm LOGGED BY JP CHECKED BY MP

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture Content	Consistency	PID (ppm)	Samples Tests Remarks	Additional Observations
						TOPSOIL					
						FILL: Silty SAND, fine to medium grained, medium graded, dark brown, dry.	D		0.2	BH18 0.3-0.5	Foreign materials such as concrete, recovered aggregate were observed.
		-0.5	0.5					0	BH18 0.6-0.8		
						FILL: Silty SAND, fine grained, poorly graded, brown, moist.	M		0.3	BH18 0.9-1.1	
		-1.0	1.0		GP	Gravelly SAND: medium grained, well graded, dark grey and orange mottled red, with gravels, moist.	M				
					SC	Clayey SAND: fine to coarse grained, well graded, light orange to light grey, moist.	M		0	BH18 1.5-1.7	
		-1.5	1.5								
						BH18 terminated at 1.7m					
		-2.0	2.0								
		-2.5	2.5								
		-3.0	3.0								

ADE_BOREHOLE / TESTPIT STS-2151-18730.GPJ STC-2209-19098-AREA A.GPJ 16/6/21



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 Telephone: 1300796922

BOREHOLE NUMBER BH19

CLIENT Arncliffe Eden Property Pty Ltd PROJECT NAME Detailed Site Investigation

PROJECT NUMBER STC-2125-18730 PROJECT LOCATION 24-46 Eden Street, Arncliffe NSW

DATE STARTED 1/12/2020 COMPLETED 1/12/2020 R.L. SURFACE 0 DATUM m -

DRILLING CONTRACTOR Epoca SLOPE 90° BEARING na

EQUIPMENT Geoprobe 7822DT CO-ORDINATES E 328773.78 N 6243110.32

HOLE SIZE 50mm LOGGED BY JP CHECKED BY MP

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture Content	Consistency	PID (ppm)	Samples Tests Remarks	Additional Observations
						TOPSOIL					
						FILL: Sandy SILT, low plasticity, dark brown, MC < PL.			0		Foreign materials such as pipe, tile, concrete and plastic were observed.
	Water encountered at 0.7 mBGL	-0.5	0.5			FILL: Silty SAND, fine grained, poorly graded, pale brown, moist.	M			BH19 0.2-0.3	
					SM	Silty SAND: coarse grained, well graded, pale brown, wet.	W		0		BH19 0.7-0.8
		-1.0	1.0						0		BH19 0.9-1
						BH19 terminated at 1m					
		-1.5	1.5								
		-2.0	2.0								
		-2.5	2.5								
		-3.0	3.0								



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BOREHOLE NUMBER BH20

CLIENT Arncliffe Eden Property Pty Ltd PROJECT NAME Detailed Site Investigation

PROJECT NUMBER STC-2125-18730 PROJECT LOCATION 24-46 Eden Street, Arncliffe NSW

DATE STARTED 1/12/2020 COMPLETED 1/12/2020 R.L. SURFACE 0 DATUM m -

DRILLING CONTRACTOR Epoca SLOPE 90° BEARING na

EQUIPMENT Geoprobe 7822DT CO-ORDINATES E 328798.98 N 6243086.82

HOLE SIZE 50mm LOGGED BY JP CHECKED BY MP

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture Content	Consistency	PID (ppm)	Samples Tests Remarks	Additional Observations
						TOPSOIL					Garden bed
						FILL: Sandy SILT, low plasticity, dark brown, MC < PL.			0.1		Foreign materials such as brick, concrete and recovered aggregate were observed.
								0		BH20 0.2-0.4	
		-0.5	0.5		SM	Silty SAND: coarse grained, well graded, pale grey, moist.	M				BH20 0.4-0.6
						BH20 terminated at 0.6m					
		-1.0	1.0								
		-1.5	1.5								
		-2.0	2.0								
		-2.5	2.5								
		-3.0	3.0								



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BOREHOLE NUMBER BH21

CLIENT Arncliffe Eden Property Pty Ltd PROJECT NAME Detailed Site Investigation
 PROJECT NUMBER STC-2125-18730 PROJECT LOCATION 24-46 Eden Street, Arncliffe NSW

DATE STARTED 1/12/2020 COMPLETED 1/12/2020 R.L. SURFACE 0 DATUM m -
 DRILLING CONTRACTOR Epoca SLOPE 90° BEARING na
 EQUIPMENT Geoprobe 7822DT CO-ORDINATES E 328765.67 N 6243098.53
 HOLE SIZE 50mm LOGGED BY JP CHECKED BY MP

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture Content	Consistency	PID (ppm)	Samples Tests Remarks	Additional Observations
						TOPSOIL			0.1		
						FILL: Sandy SILT, low plasticity, dark brown, MC < PL.			0	BH21 0.1-0.2	
									0.1	BH21 0.2-0.4	
		-0.5	0.5			FILL: SAND, fine to medium grained, well graded, light brown, moist.	M			BH21 0.4-0.5	
						SANDSTONE: pale grey.			0		
										BH21 0.7-0.8	
						BH21 terminated at 0.8m					
		-1.0	1.0								
		-1.5	1.5								
		-2.0	2.0								
		-2.5	2.5								
		-3.0	3.0								



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BOREHOLE NUMBER BH22

CLIENT Arncliffe Eden Property Pty Ltd PROJECT NAME Detailed Site Investigation
 PROJECT NUMBER STC-2125-18730 PROJECT LOCATION 24-46 Eden Street, Arncliffe NSW

DATE STARTED 1/12/2020 COMPLETED 1/12/2020 R.L. SURFACE 0 DATUM m -
 DRILLING CONTRACTOR Epoca SLOPE 90° BEARING na
 EQUIPMENT Geoprobe 7822DT CO-ORDINATES E 328379.27 N 6243093.54
 HOLE SIZE 50mm LOGGED BY JP CHECKED BY MP

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture Content	Consistency	PID (ppm)	Samples Tests Remarks	Additional Observations
						TOPSOIL			0		
						FILL: Sandy SILT, low plasticity, dark brown, MC < PL.			0.2	BH22 0.1-0.2	
										BH22 0.2-0.4	
		-0.5	0.5		GP	Sandy GRAVEL: medium grained, poorly graded, angular, dark red with orange, dry.	D		0	BH22 0.4-0.6	
						SANDSTONE: pale grey.			0	BH22 0.6-0.8	
						BH22 terminated at 0.8m					
		-1.0	1.0								
		-1.5	1.5								
		-2.0	2.0								
		-2.5	2.5								
		-3.0	3.0								

APPENDIX V - CHAIN OF CUSTODY DOCUMENTATION AND ANALYTICAL REPORTS

SAMPLE DATA		CONTAINER DATA		ANALYSES REQUIRED														Mould	NOTES							
LIMS Sample ID (Lab Use)	Sample ID (ADE)	MATRIX	SAMPLE DATE	TYPE & PRESERVATIVE	NO.	6 Metal Suite	8 Metal Suite	BTEX	PAH	Napthalene	OCP/OPP	PCB	VTRH (C6-C10)	TRH (C10-C40)	pH/EC	pH/pH fox	PFAS	Bulk	Dust	Dust Swab	Soil 65g	Soil 500g NEPM	Airborne Asbestos Monitoring	Mould	POTENTIAL HAZARDOUS CONTAMINANTS:	
2020026 534	DSI-BH1(0.3)	SOIL	30.11.20	AG B	1	x	x	x	x				x	x								x				ASBESTOS
535	DSI-BH1(0.5)	SOIL	30.11.20	AG PFAS	2	x	x	x	x		x	x	x	x			x									HYDROCARBONS
536	DSI-BH1(1.3)	SOIL	30.11.20	AG	3	x	x	x	x				x	x												NO KNOWN CONTAMINATION
537	DSI-BH2(0.3)	SOIL	30.11.20	AG PFAS	4	x	x	x	x				x	x			x									OTHER:
538	DSI-BH2(0.9)	SOIL	30.11.20	G-B	5	x	x	x	x				x	x												
539	DSI-BH3(0.9)	SOIL	30.11.20	G-B PFAS	6	x	x	x	x				x	x			x									
540	DSI-BH3(1.4)	SOIL	30.11.20	G-B	7	x	x	x	x				x	x												
541	DSI-BH4(0.2)	SOIL	30.11.20	G-B PFAS	8	x	x	x	x				x	x			x									
542	DSI-BH4(0.6)	SOIL	30.11.20	G-B	9	x	x	x	x				x	x												
543	DSI-BH5(0.5)	SOIL	30.11.20	B G PFAS	10	x	x	x	x				x	x			x				x					
544	DSI-BH5(0.9)	SOIL	30.11.20	G	11	x	x	x	x				x	x												
545	DSI-BH6(1.0-1.1)	SOIL	30.11.20	G PFAS	12	x	x	x	x				x	x			x									
546	DSI-BH6(1.8-2.0)	SOIL	30.11.20	G	13	x	x	x	x		x	x	x	x												
547	DSI-BH7(0.5-0.6)	SOIL	30.11.20	G PFAS	14	x	x	x	x				x	x			x									
548	DSI-BH8(0.2-0.3)	SOIL	30.11.20	G PFAS	15	x	x	x	x				x	x			x									
549	DSI-BH8(0.8-0.9)	SOIL	30.11.20	G	16	x	x	x	x				x	x												
550	DSI-BH9(0.3-0.4)	SOIL	30.11.20	B G PFAS	17	x	x	x	x				x	x			x				x					
551	DSI-BH9(0.5-0.6)	SOIL	30.11.20	G	18	x	x	x	x				x	x												
552	DSI-BH10(0.7-0.9)	SOIL	30.11.20	G PFAS	19	x	x	x	x				x	x			x									
553	DSI-BH10(0.9-1.1)	SOIL	30.11.20	G	20	x	x	x	x				x	x			x									

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550	DSI-BH9(0.3-0.4)	SOIL	30.11.20	B G PFAS	17	x	x	x	x			x	x			✓			X		
551	DSI-BH9(0.5-0.6)	SOIL	30.11.20	G	18	x	x	x	x			x	x								
552	DSI-BH10(0.7-0.9)	SOIL	30.11.20	G PFAS	19	x	x	x	x			x	x			✓					
553	DSI-BH10(0.5-0.6)	SOIL	30.11.20	G	20	x	x	x	x			x	x								
554	DSI-BH11(0.2-0.3) (0.3-0.4)	SOIL	30.11.20	B G PFAS	21	x	x	x	x			x	x			✓			X		
555	DSI-BH11(0.5-0.6)	SOIL	30.11.20	G	22	x	x	x	x	X	X	x	x								
556	DSI-BH12(0.7-1.0)	SOIL	30.11.20	G PFAS	23	x	x	x	x			x	x			✓					
557	DSI-BH12(1.1-1.3)	SOIL	30.11.20	G	24	x	x	x	x	X	X	x	x								
610	DSI-BH13(0.2-0.3) 5 B	SOIL	30.11.20	B	25	x	x	x	x	X	X	x	x			✓			X		
558	DSI-BH13(0.5-0.6) 5	SOIL	30.11.20	G PFAS		x	x	x	x			x	x			✓					
559	DSI-BH13(1.1-1.2)	SOIL	30.11.20	G	26	x	x	x	x			x	x								
560	DSI-BH14(0.5-0.6)	SOIL	30.11.20	G PFAS	27	x	x	x	x			x	x			✓					
561	DSI-BH14(0.9-1.0)	SOIL	30.11.20	G	28	x	x	x	x			x	x								
562	DSI-BH15(0.2-0.3)	SOIL	1.12.2020	G PFAS	29	x	x	x	x			x	x			✓					
563	DSI-BH15(0.6-0.8)	SOIL	1.12.2020	G	30	x	x	x	x			x	x								
564	DSI-BH16(0.3-0.4)	SOIL	1.12.2020	G PFAS	31	x	x	x	x	X	X	x	x			✓					
565	DSI-BH17(0.5-0.8)	SOIL	1.12.2020	G PFAS	32	x	x	x	x	X	X	x	x			✓					
566	DSI-BH17(0.1-0.3)	SOIL	1.12.2020	G	33	x	x	x	x			x	x								
567	DSI-BH18(0.3-0.5)	SOIL	1.12.2020	G PFAS	34	x	x	x	x			x	x			✓					
568	DSI-BH18(1.5-1.7)	SOIL	1.12.2020	G	35	x	x	x	x			x	x								
569	DSI-BH19(0.2-0.3)	SOIL	1.12.2020	B G PFAS	36	x	x	x	x	X	X	x	x			✓			x		
570	DSI-BH19(0.7-0.8)	SOIL	1.12.2020		37	x	x	x	x			x	x								
570	DSI-BH19(0.9-1.0)	SOIL	1.12.2020	G	38	x	x	x	x			x	x								
571	DSI-BH20(0.2-0.4)	SOIL	1.12.2020	G PFAS	39	x	x	x	x	X	X	x	x			✓			x		
572	DSI-BH20(0.4-0.6)	SOIL	1.12.2020	G	40	x	x	x	x			x	x								
573	DSI-BH21(0.2-0.4)	SOIL	1.12.2020	G PFAS	41	x	x	x	x			x	x			✓					
574	DSI-BH21(0.7-0.8)	SOIL	1.12.2020	G	42	x	x	x	x	X	X	x	x								
575	DSI-BH22(0.4-0.6) 5	SOIL	1.12.2020	G	43	x	x	x	x			x	x								
576	DSI-BH22(0.2-0.4) 5	SOIL	1.12.2020	B G PFAS	44	x	x	x	x	X	X	x	x			✓			x		
	DSI-BH22(0.8-0.8)	SOIL	1.12.2020			x	x	x	x	X	X	x	x			✓					
	DSI-BH9(0.3-0.4)	SOIL																	X		
611	DSI-BH21(0.1-0.2)	SOIL		B															X		
612	DSI-BH8(0.5)	SOIL		B															X		
613	DSI-BH7(0.2-0.3)	SOIL		G PFAS		X	X	X	X	X	X	X	X						X		
614	DSI-BH17(0.3-0.5)	SOIL		B															X		
615	DSI-BR1	SOIL		G		x	x	x	x			x	x								
616	DSI-BR2	SOIL		G		x	x	x	x			x	x								

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Sydney Laboratory Services

A division of A. D. Envirotech Australia Pty Ltd
A.C.N. 093 452 950
Unit 4/10-11 Millennium Court,
Silverwater 2128
Ph: (02) 9648-6669

Accreditation No.14664
Accredited for compliance with ISO/IEC 17025 - Testing.

SAMPLE RECEIPT NOTIFICATION (SRN)

Contact: Marl Potts
Project name: STC-2151-18730
Number of samples: 50
COC number: STC-2151-18730
Turn around time: Standard
Date: 03.12.2020
Time received: 7:00 AM
SLS Reference: 2004163
ASB 1
Estimated Report Delivery Date: 10.12.2020

Sample information

- All samples have been received and logged into LIMS.
- No mistakes in the COC
- Samples were chilled
- N/A Samples were preserved
- N/A Custody seal intact
- Samples were delivered within holding time
- Samples to be tested for volatiles had zero headspace
- All samples were received in good condition (no broken jars, labelled correctly...).
- Samples have been subcontracted

Comments

This report contains:

Sample receipt non-conformities
Summary of samples and requested analysis
Requested report deliverables

Contact details

If you have any questions with respect to these samples please contact:
sls@ade.group



Jasmine Franco

Summary of sample(s) and requested analysis

Laboratory Sample ID	Client Sample ID	6 Metal Suite	8 Metal Suite	BTEX	PAH	Naphthalene	OCF/OPP	PCB	VTRH	TRH	pH/EC	PFAS	Soil 65 g
2020026534	DSI-BH1(0.3)	X	X	X	X				X	X			X
2020026535	DSI-BH1(0.5)	X	X	X	X		X	X	X	X		X	
2020026536	DSI-BH1(1.3)	X	X	X	X				X	X			
2020026537	DSI-BH2(0.3)	X	X	X	X				X	X		X	
2020026538	DSI-BH2(0.9)	X	X	X	X				X	X			
2020026539	DSI-BH3(0.9)	X	X	X	X				X	X		X	
2020026540	DSI-BH3(1.4)	X	X	X	X				X	X			
2020026541	DSI-BH4(0.2)	X	X	X	X				X	X		X	
2020026542	DSI-BH4(0.6)	X	X	X	X				X	X			
2020026543	DSI-BH5(0.5)	X	X	X	X				X	X		X	X
2020026544	DSI-BH5(0.9)	X	X	X	X				X	X			
2020026545	DSI-BH6(1.0-1.1)	X	X	X	X				X	X		X	
2020026546	DSI-BH6(0.5-0.6)	X	X	X	X		X	X	X	X			
2020026547	DSI-BH7(0.5-0.6)	X	X	X	X				X	X		X	
2020026548	DSI-BH8(0.2-0.3)	X	X	X	X				X	X		X	
2020026549	DSI-BH8(0.8-0.9)	X	X	X	X				X	X			
2020026550	DSI-BH9(0.3-0.4)	X	X	X	X				X	X		X	X
2020026551	DSI-BH9(0.5-0.6)	X	X	X	X				X	X			
2020026552	DSI-BH10(0.7-0.9)	X	X	X	X				X	X		X	
2020026553	DSI-BH10(0.5-0.6)	X	X	X	X				X	X			
2020026554	DSI-BH11(0.3-0.4)	X	X	X	X				X	X		X	X
2020026555	DSI-BH11(0.5-0.6)	X	X	X	X		X	X	X	X			
2020026556	DSI-BH12(1.1-1.3)	X	X	X	X				X	X		X	
2020026557	DSI-BH12(1.1-1.3)	X	X	X	X		X	X	X	X			
2020026610	DSI-BH13(0.5-0.6)												X
2020026558	DSI-BH13(0.5-0.6)	X	X	X	X				X	X		X	
2020026559	DSI-BH13(1.1-1.2)	X	X	X	X				X	X			
2020026560	DSI-BH14(0.5-0.6)	X	X	X	X				X	X		X	
2020026561	DSI-BH14(0.9-1.0)	X	X	X	X				X	X			
2020026562	DSI-BH15(0.2-0.3)	X	X	X	X				X	X		X	
2020026563	DSI-BH15(0.6-0.8)	X	X	X	X				X	X			
2020026564	DSI-BH16(0.3-0.4)	X	X	X	X		X	X	X	X		X	
2020026565	DSI-BH17(0.5-0.8)	X	X	X	X		X	X	X	X		X	
2020026566	DSI-BH17(0.1-0.3)	X	X	X	X				X	X			
2020026567	DSI-BH18(0.3-0.5)	X	X	X	X				X	X		X	
2020026568	DSI-BH18(1.5-1.7)	X	X	X	X				X	X			
2020026569	DSI-BH19(0.2-0.3)	X	X	X	X		X	X	X	X		X	
2020026570	DSI-BH19(0.9-1.0)	X	X	X	X				X	X			
2020026571	DSI-BH20(0.2-0.4)	X	X	X	X		X	X	X	X		X	
2020026572	DSI-BH20(0.4-0.6)	X	X	X	X				X	X			
2020026573	DSI-BH21(0.2-0.4)	X	X	X	X				X	X		X	
2020026574	DSI-BH21(0.7-0.8)	X	X	X	X		X	X	X	X			
2020026575	DSI-BH22(0.4-0.6)	X	X	X	X				X	X			
2020026576	DSI-BH22(0.2-0.4)	X	X	X	X				X	X		X	
2020026611	DSI-BH21 (0.1-0.2)												X
2020026612	DSI-BH8(0.5)												X
2020026614	DSI-BH7(0.2-0.3)	X	X	X	X		X	X	X	X			
2020026613	DSI-BH17-(0.3-0.5)												X
2020026615	DS1-BR1	X	X	X	X				X	X			
2020026616	DS1-BR2	X	X	X	X				X	X			

Sydney Laboratory Services

A division of A. D. Envirotech Australia Pty Ltd
A.C.N. 093 452 950
Unit 4/10-11 Millennium Court,
Silverwater 2128
Ph: (02) 9648-6669



Accreditation No.14664
Accredited for compliance with ISO/IEC 17025 - Testing.

This certificate of analysis contains General Comments and Analytical Results. Quality Control Report and Laboratory Quality Acceptance Criteria have been issued separately.

This report supersedes any previous report(s) with this reference. This document shall not be reproduced, except in full.

This report has been electronically signed by authorised signatories below.

Authorised By

A handwritten signature in black ink, appearing to read "Jasmine Franco", is written over a light grey rectangular background.

Jasmine Franco

General Comments

Samples are analysed on as received basis. Sampling is not covered by NATA accreditation.

Where moisture determination has been performed, results are reported on dry weight basis.

Where the PQL of reported result differs from standard PQL, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Samples were analysed within holding time described by laboratory internal procedures if not stated otherwise. If samples delivered do not meet required analytical criteria, results will be marked with ^.

However surrogate standards are added to samples, results are not corrected for standards recoveries.

Analysis of VOC in water samples are performed on unfiltered waters (as received) spiked with surrogates and injection standards only.

SLS is responsible for all the information in the report, except that provided by the customer.

All sampling information included in the report has been provided by customer; ADE Consulting Group.

Information provided by ADE Consulting Group can affect the validity of the results.

Certificate of Analysis

Contact:	Mark Potts	Date Reported:	10/12/2020
Customer:	ADE Consulting Group	No. of Samples:	46
Address:	Unit 6 7 Millennium Court Silverwater NSW	Date Received:	3/12/2020
Cust Ref:	STC-2151-18730	Date of Analysis:	3/12/2020

Glossary:

- *NATA accreditation does not cover the performance of this service
- ND-not detected,
- NT-not tested
- INS-Insufficient material to perform the test
- LCS-Laboratory Control Sample
- RPD-Relative Percent Difference
- N/A-Not Applicable
- < less than
- > greater than
- PQL- Practical Quantitation Limit
- ^Analytical result might be compromised due to sample condition or holding time requirements
- Reaction rate 1 = Slight
- Reaction rate 2 = Moderate
- Reaction rate 3 = High
- Reaction rate 4 = Vigorous

Certificate of Analysis

Sample ID:	2020026534	2020026535	2020026536	2020026537	2020026538	2020026539	2020026540	2020026541	2020026542	2020026543	2020026544
Sample Name	DSI-BH1(0.3)	DSI-BH1(0.5)	DSI-BH1(1.3)	DSI-BH2(0.3)	DSI-BH2(0.9)	DSI-BH3(0.9)	DSI-BH3(1.4)	DSI-BH4(0.2)	DSI-BH4(0.6)	DSI-BH5(0.5)	DSI-BH5(0.9)

Parameter	Units	PQL											
ESA-P-ORG7 & ORG8													
Benzene	mg/kg	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	mg/kg	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	mg/kg	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
m.p Xylene	mg/kg	2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
o Xylene	mg/kg	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sum of BTEX	mg/kg		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Xylenes	mg/kg		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fluorobenzene (Surr.)	%		91	93	93	100	92	89	90	93	91	94	92
C6-C10	mg/kg	35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35
C6-C10 minus BTEX	mg/kg	35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35
C6-C9	mg/kg	25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
ESA-MP-01,ICP-01													
Arsenic	mg/kg	5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cadmium	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Chromium	mg/kg	5	<5.0	<5.0	8.4	<5.0	7.8	13.9	11.1	5.7	14.3	5.4	<5.0
Copper	mg/kg	5	27.6	<5.0	<5.0	80.6	<5.0	<5.0	<5.0	28.1	<5.0	46.4	<5.0
Lead	mg/kg	10	38.1	<10.0	<10.0	52.2	<10.0	<10.0	<10.0	102.4	<10.0	77.7	<10.0
Mercury	mg/kg	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Nickel	mg/kg	10	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Zinc	mg/kg	5	61.1	<5.0	<5.0	62.1	<5.0	<5.0	<5.0	73.0	<5.0	98.9	<5.0
ESA-P-12													
% Moisture Content	%		4.0	3.1	6.7	3.1	6.8	12.4	11.8	7.8	11.8	3.3	7.2
ESA-P-ORG(11 - 15)													
Acenaphthene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Acenaphthylene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Anthracene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Benzo[a]anthracene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Benzo[a]pyrene	mg/kg	0.3	<0.30	<0.30	<0.30	0.38	<0.30	<0.30	<0.30	<0.30	<0.30	0.37	<0.30

Benzo[b]fluoranthene	mg/kg	0.3	<0.30	<0.30	<0.30	0.43	<0.30	<0.30	<0.30	<0.30	<0.30	0.42	<0.30
Benzo[g,h,i]perylene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Benzo[k]fluoranthene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Chrysene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Dibenzo[a,h]anthracene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Fluoranthene	mg/kg	0.3	0.35	<0.30	<0.30	0.54	<0.30	<0.30	<0.30	<0.30	<0.30	0.44	<0.30
Fluorene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Indeno(1,2,3-cd)pyrene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Naphthalene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Phenanthrene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Pyrene	mg/kg	0.3	0.38	<0.30	<0.30	0.61	<0.30	<0.30	<0.30	<0.30	<0.30	0.51	<0.30
Sum of Positive PAHs	mg/kg		0.73	0.00	0.00	1.96	0.00	0.00	0.00	0.00	0.00	1.74	0.00
Benzo(a)pyrene TEQ (Zero)	mg/kg		0.00	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.41	0.00
Benzo(a)pyrene TEQ (Half PQL)	mg/kg		0.36	0.36	0.36	0.62	0.36	0.36	0.36	0.36	0.36	0.61	0.36
Benzo(a)pyrene TEQ (PQL)	mg/kg		0.73	0.73	0.73	0.82	0.73	0.73	0.73	0.73	0.73	0.81	0.73
p-Terphenyl-d14 (Surr.)	%		108	106	106	105	102	102	103	104	98	101	111
aldrin	mg/kg	0.1		<0.10									
a-BHC	mg/kg	0.1		<0.10									
b-BHC	mg/kg	0.1		<0.10									
d-BHC	mg/kg	0.1		<0.10									
g-BHC (lindane)	mg/kg	0.1		<0.10									
cis-chlordane	mg/kg	0.1		<0.10									
trans-chlordane	mg/kg	0.1		<0.10									
4,4'-DDD	mg/kg	0.1		<0.10									
4,4'-DDE	mg/kg	0.1		<0.10									
4,4'-DDT	mg/kg	0.1		<0.10									
dieldrin	mg/kg	0.1		<0.10									
endosulfan I	mg/kg	0.2		<0.20									
endosulfan II	mg/kg	0.2		<0.20									
endosulfan sulfate	mg/kg	0.1		<0.10									
endrin	mg/kg	0.2		<0.20									
endrin aldehyde	mg/kg	0.1		<0.10									
endrin ketone	mg/kg	0.1		<0.10									

heptachlor	mg/kg	0.1		<0.10									
heptachlor epoxide	mg/kg	0.1		<0.10									
hexachlorobenzene	mg/kg	0.1		<0.10									
methoxychlor	mg/kg	0.1		<0.10									
TCMX (Surr.)	%			98									
chlorpyrifos	mg/kg	0.1		<0.10									
chlorpyrifos methyl	mg/kg	0.1		<0.10									
diazinon	mg/kg	0.1		<0.10									
fenchlorphos	mg/kg	0.1		<0.10									
methyl parathion	mg/kg	0.1		<0.10									
prophos	mg/kg	0.1		<0.10									
tributylphosphorotrithioite	mg/kg	0.1		<0.10									
Aroclor 1016	mg/kg	0.5		<0.50									
Aroclor 1221	mg/kg	0.5		<0.50									
Aroclor 1232	mg/kg	0.5		<0.50									
Aroclor 1242	mg/kg	0.5		<0.50									
Aroclor 1248	mg/kg	0.5		<0.50									
Aroclor 1254	mg/kg	0.5		<0.50									
Aroclor 1260	mg/kg	0.5		<0.50									
2-fluorobiphenyl (Surr.)	%			98									
ESA-P-ORG(3,5,6,8)													
>C10-C16	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
>C16-C34	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
>C34-C40	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
>C10-C40 (Sum of total)	mg/kg		0	0	0	0	0	0	0	0	0	0	0
C10-C14	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C15-C28	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C29-C36	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C10-C36 (Sum of total)	mg/kg		0	0	0	0	0	0	0	0	0	0	0

Certificate of Analysis

Sample ID: 2020026545 2020026546 2020026547 2020026548 2020026549 2020026550 2020026551 2020026552 2020026553 2020026554 2020026555

Sample Name DSI-BH6(1.0-1.1) DSI-BH6(0.5-0.6) DSI-BH7(0.5-0.6) DSI-BH8(0.2-0.3) DSI-BH8(0.8-0.9) DSI-BH9(0.3-0.4) DSI-BH9(0.5-0.6) DSI-BH10(0.7-0.9) DSI-BH10(0.5-0.6) DSI-BH11(0.3-0.4) DSI-BH11(0.5-0.6)

Parameter	Units	PQL											
ESA-P-ORG7 & ORG8													
Benzene	mg/kg	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	mg/kg	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	mg/kg	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
m.p Xylene	mg/kg	2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
o Xylene	mg/kg	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sum of BTEX	mg/kg		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Xylenes	mg/kg		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fluorobenzene (Surr.)	%		92	94	103	98	92	90	93	90	90	87	110
C6-C10	mg/kg	35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35
C6-C10 minus BTEX	mg/kg	35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35
C6-C9	mg/kg	25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
ESA-MP-01,ICP-01													
Arsenic	mg/kg	5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cadmium	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Chromium	mg/kg	5	7.6	<5.0	7.9	8.1	7.1	9.3	<5.0	<5.0	5.9	6.3	<5.0
Copper	mg/kg	5	<5.0	19.9	<5.0	6.2	<5.0	46.6	<5.0	<5.0	<5.0	19.2	<5.0
Lead	mg/kg	10	<10.0	50.3	<10.0	11.0	<10.0	133.1	<10.0	<10.0	<10.0	349.3	<10.0
Mercury	mg/kg	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.47	<0.20
Nickel	mg/kg	10	<10.0	<10.0	<10.0	<10.0	<10.0	20.0	<10.0	<10.0	<10.0	<10.0	<10.0
Zinc	mg/kg	5	<5.0	54.4	<5.0	13.5	<5.0	104.9	<5.0	11.2	13.3	75.9	10.9
ESA-P-12													
% Moisture Content	%		12.0	20.1	6.1	3.7	3.8	5.4	5.3	6.6	7.4	11.5	3.0
ESA-P-ORG(11 - 15)													
Acenaphthene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Acenaphthylene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Anthracene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Benzo[a]anthracene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30

Benzo[a]pyrene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Benzo[b]fluoranthene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Benzo[g,h,i]perylene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Benzo[k]fluoranthene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.35	<0.30
Chrysene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Dibenzo[a,h]anthracene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Fluoranthene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Fluorene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Indeno(1,2,3-cd)pyrene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Naphthalene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Phenanthrene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Pyrene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.31	<0.30
Sum of Positive PAHs	mg/kg		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.00
Benzo(a)pyrene TEQ (Zero)	mg/kg		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00
Benzo(a)pyrene TEQ (Half PQL)	mg/kg		0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.38	0.36
Benzo(a)pyrene TEQ (PQL)	mg/kg		0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
p-Terphenyl-d14 (Surr.)	%		112	111	112	110	112	109	110	112	114	100	100
aldrin	mg/kg	0.1		<0.10									<0.10
a-BHC	mg/kg	0.1		<0.10									<0.10
b-BHC	mg/kg	0.1		<0.10									<0.10
d-BHC	mg/kg	0.1		<0.10									<0.10
g-BHC (lindane)	mg/kg	0.1		<0.10									<0.10
cis-chlordane	mg/kg	0.1		<0.10									<0.10
trans-chlordane	mg/kg	0.1		<0.10									<0.10
4,4'-DDD	mg/kg	0.1		<0.10									<0.10
4,4'-DDE	mg/kg	0.1		<0.10									<0.10
4,4'-DDT	mg/kg	0.1		<0.10									<0.10
dieldrin	mg/kg	0.1		<0.10									<0.10
endosulfan I	mg/kg	0.2		<0.20									<0.20
endosulfan II	mg/kg	0.2		<0.20									<0.20
endosulfan sulfate	mg/kg	0.1		<0.10									<0.10
endrin	mg/kg	0.2		<0.20									<0.20
endrin aldehyde	mg/kg	0.1		<0.10									<0.10

endrin ketone	mg/kg	0.1		<0.10									<0.10
heptachlor	mg/kg	0.1		<0.10									<0.10
heptachlor epoxide	mg/kg	0.1		<0.10									<0.10
hexachlorobenzene	mg/kg	0.1		<0.10									<0.10
methoxychlor	mg/kg	0.1		<0.10									<0.10
TCMX (Surr.)	%			99									96
chlorpyrifos	mg/kg	0.1		<0.10									<0.10
chlorpyrifos methyl	mg/kg	0.1		<0.10									<0.10
diazinon	mg/kg	0.1		<0.10									<0.10
fenchlorphos	mg/kg	0.1		<0.10									<0.10
methyl parathion	mg/kg	0.1		<0.10									<0.10
prophos	mg/kg	0.1		<0.10									<0.10
tributylphosphorotrithioite	mg/kg	0.1		<0.10									<0.10
Aroclor 1016	mg/kg	0.5		<0.50									<0.50
Aroclor 1221	mg/kg	0.5		<0.50									<0.50
Aroclor 1232	mg/kg	0.5		<0.50									<0.50
Aroclor 1242	mg/kg	0.5		<0.50									<0.50
Aroclor 1248	mg/kg	0.5		<0.50									<0.50
Aroclor 1254	mg/kg	0.5		<0.50									<0.50
Aroclor 1260	mg/kg	0.5		<0.50									<0.50
2-fluorobiphenyl (Surr.)	%			100									96
ESA-P-ORG(3,5,6,8)													
>C10-C16	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
>C16-C34	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
>C34-C40	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
>C10-C40 (Sum of total)	mg/kg		0	0	0	0	0	0	0	0	0	0	0
C10-C14	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C15-C28	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C29-C36	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C10-C36 (Sum of total)	mg/kg		0	0	0	0	0	0	0	0	0	0	0

Certificate of Analysis

Sample ID: 2020026556 2020026557 2020026558 2020026559 2020026560 2020026561 2020026562 2020026563 2020026564 2020026565 2020026566

Sample Name DSI-BH12(0.7-1.0) DSI-BH12(1.1-1.3) DSI-BH13(0.5-0.6) DSI-BH13(1.1-1.2) DSI-BH14(0.5-0.6) DSI-BH14(0.9-1.0) DSI-BH15(0.2-0.3) DSI-BH15(0.6-0.8) DSI-BH16(0.3-0.4) DSI-BH17(0.5-0.8) DSI-BH17(0.1-0.3)

Parameter	Units	PQL											
ESA-P-ORG7 & ORG8													
Benzene	mg/kg	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	mg/kg	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	mg/kg	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
m.p Xylene	mg/kg	2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
o Xylene	mg/kg	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sum of BTEX	mg/kg		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Xylenes	mg/kg		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fluorobenzene (Surr.)	%		104	89	94	90	88	79	107	97	101	105	116
C6-C10	mg/kg	35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35
C6-C10 minus BTEX	mg/kg	35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35
C6-C9	mg/kg	25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
ESA-MP-01,ICP-01													
Arsenic	mg/kg	5	<5.0	<5.0	<5.0	<5.0	20.4	<5.0	5.2	<5.0	<5.0	<5.0	<5.0
Cadmium	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Chromium	mg/kg	5	6.8	16.3	8.7	8.6	<5.0	7.0	7.8	<5.0	<5.0	5.7	7.9
Copper	mg/kg	5	<5.0	<5.0	<5.0	<5.0	6.7	<5.0	27.7	<5.0	15.1	<5.0	13.3
Lead	mg/kg	10	10.3	<10.0	<10.0	<10.0	112.8	<10.0	239.4	<10.0	90.8	<10.0	93.3
Mercury	mg/kg	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Nickel	mg/kg	10	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Zinc	mg/kg	5	12.3	<5.0	5.6	<5.0	38.1	<5.0	108.5	21.7	96.2	<5.0	57.9
ESA-P-12													
% Moisture Content	%		4.5	10.9	7.6	14.7	9.6	9.1	3.9	6.8	4.4	3.1	4.7
ESA-P-ORG(11 - 15)													
Acenaphthene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Acenaphthylene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Anthracene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Benzo[a]anthracene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30

Benzo[a]pyrene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	0.32	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Benzo[b]fluoranthene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	0.35	<0.30	<0.30	<0.30	<0.30	<0.30	0.30
Benzo[g,h,i]perylene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Benzo[k]fluoranthene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Chrysene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	0.32	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Dibenzo[a,h]anthracene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Fluoranthene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	0.65	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Fluorene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Indeno(1,2,3-cd)pyrene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Naphthalene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Phenanthrene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	0.34	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Pyrene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	0.68	<0.30	0.30	<0.30	<0.30	<0.30	0.35
Sum of Positive PAHs	mg/kg		0.00	0.00	0.00	0.00	2.66	0.00	0.30	0.00	0.00	0.00	0.65
Benzo(a)pyrene TEQ (Zero)	mg/kg		0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.03
Benzo(a)pyrene TEQ (Half PQL)	mg/kg		0.36	0.36	0.36	0.36	0.55	0.36	0.36	0.36	0.36	0.36	0.38
Benzo(a)pyrene TEQ (PQL)	mg/kg		0.73	0.73	0.73	0.73	0.75	0.73	0.73	0.73	0.73	0.73	0.73
p-Terphenyl-d14 (Surr.)	%		107	103	108	105	103	105	103	115	101	107	104
aldrin	mg/kg	0.1		<0.10							<0.10	<0.10	
a-BHC	mg/kg	0.1		<0.10							<0.10	<0.10	
b-BHC	mg/kg	0.1		<0.10							<0.10	<0.10	
d-BHC	mg/kg	0.1		<0.10							<0.10	<0.10	
g-BHC (lindane)	mg/kg	0.1		<0.10							<0.10	<0.10	
cis-chlordane	mg/kg	0.1		<0.10							<0.10	<0.10	
trans-chlordane	mg/kg	0.1		<0.10							<0.10	<0.10	
4,4'-DDD	mg/kg	0.1		<0.10							<0.10	<0.10	
4,4'-DDE	mg/kg	0.1		<0.10							<0.10	<0.10	
4,4'-DDT	mg/kg	0.1		<0.10							<0.10	<0.10	
dieldrin	mg/kg	0.1		<0.10							<0.10	<0.10	
endosulfan I	mg/kg	0.2		<0.20							<0.20	<0.20	
endosulfan II	mg/kg	0.2		<0.20							<0.20	<0.20	
endosulfan sulfate	mg/kg	0.1		<0.10							<0.10	<0.10	
endrin	mg/kg	0.2		<0.20							<0.20	<0.20	
endrin aldehyde	mg/kg	0.1		<0.10							<0.10	<0.10	

endrin ketone	mg/kg	0.1		<0.10							<0.10	<0.10	
heptachlor	mg/kg	0.1		<0.10							<0.10	<0.10	
heptachlor epoxide	mg/kg	0.1		<0.10							<0.10	<0.10	
hexachlorobenzene	mg/kg	0.1		<0.10							<0.10	<0.10	
methoxychlor	mg/kg	0.1		<0.10							<0.10	<0.10	
TCMX (Surr.)	%			97							94	100	
chlorpyrifos	mg/kg	0.1		<0.10							<0.10	<0.10	
chlorpyrifos methyl	mg/kg	0.1		<0.10							<0.10	<0.10	
diazinon	mg/kg	0.1		<0.10							<0.10	<0.10	
fenchlorphos	mg/kg	0.1		<0.10							<0.10	<0.10	
methyl parathion	mg/kg	0.1		<0.10							<0.10	<0.10	
prophos	mg/kg	0.1		<0.10							<0.10	<0.10	
tributylphosphorotrithioite	mg/kg	0.1		<0.10							<0.10	<0.10	
Aroclor 1016	mg/kg	0.5		<0.50							<0.50	<0.50	
Aroclor 1221	mg/kg	0.5		<0.50							<0.50	<0.50	
Aroclor 1232	mg/kg	0.5		<0.50							<0.50	<0.50	
Aroclor 1242	mg/kg	0.5		<0.50							<0.50	<0.50	
Aroclor 1248	mg/kg	0.5		<0.50							<0.50	<0.50	
Aroclor 1254	mg/kg	0.5		<0.50							<0.50	<0.50	
Aroclor 1260	mg/kg	0.5		<0.50							<0.50	<0.50	
2-fluorobiphenyl (Surr.)	%			98							94	99	
ESA-P-ORG(3,5,6,8)													
>C10-C16	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
>C16-C34	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
>C34-C40	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
>C10-C40 (Sum of total)	mg/kg		0	0	0	0	0	0	0	0	0	0	0
C10-C14	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C15-C28	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C29-C36	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C10-C36 (Sum of total)	mg/kg		0	0	0	0	0	0	0	0	0	0	0

Certificate of Analysis

Sample ID: 2020026567 2020026568 2020026569 2020026570 2020026571 2020026572 2020026573 2020026574 2020026575 2020026576 2020026614

Sample Name DSI-BH18(0.3-0.5) DSI-BH18(1.5-1.7) DSI-BH19(0.2-0.3) DSI-BH19(0.9-1.0) DSI-BH20(0.2-0.4) DSI-BH20(0.4-0.6) DSI-BH21(0.2-0.4) DSI-BH21(0.7-0.8) DSI-BH22(0.4-0.6) DSI-BH22(0.2-0.4) DSI-BH7(0.2-0.3)

Parameter	Units	PQL											
ESA-P-ORG7 & ORG8													
Benzene	mg/kg	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	mg/kg	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	mg/kg	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
m.p Xylene	mg/kg	2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
o Xylene	mg/kg	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sum of BTEX	mg/kg		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Xylenes	mg/kg		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fluorobenzene (Surr.)	%		112	102	93	107	100	97	99	101	98	95	96
C6-C10	mg/kg	35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35
C6-C10 minus BTEX	mg/kg	35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35
C6-C9	mg/kg	25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
ESA-MP-01,ICP-01													
Arsenic	mg/kg	5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	8.6	8.3	<5.0
Cadmium	mg/kg	0.3	0.32	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Chromium	mg/kg	5	8.3	21.3	9.3	8.1	17.8	<5.0	<5.0	<5.0	33.6	7.0	5.0
Copper	mg/kg	5	60.7	<5.0	32.5	10.1	21.7	<5.0	<5.0	<5.0	<5.0	14.7	23.3
Lead	mg/kg	10	188.3	<10.0	66.5	15.2	84.6	<10.0	38.2	<10.0	13.4	114.3	51.4
Mercury	mg/kg	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Nickel	mg/kg	10	<10.0	<10.0	26.6	<10.0	19.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Zinc	mg/kg	5	177.1	<5.0	144.2	133.3	98.3	14.7	98.6	<5.0	16.4	76.2	51.8
ESA-P-12													
% Moisture Content	%		5.1	13.7	5.2	16.5	6.7	6.6	7.7	9.4	9.5	6.7	3.9
ESA-P-ORG(11 - 15)													
Acenaphthene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Acenaphthylene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Anthracene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	0.60	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Benzo[a]anthracene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	1.40	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30

Benzo[a]pyrene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	1.76	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Benzo[b]fluoranthene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	1.81	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Benzo[g,h,i]perylene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	1.29	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Benzo[k]fluoranthene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	0.75	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Chrysene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	1.53	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Dibenzo[a,h]anthracene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Fluoranthene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	4.91	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Fluorene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Indeno(1,2,3-cd)pyrene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	0.90	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Naphthalene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Phenanthrene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	3.70	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Pyrene	mg/kg	0.3	<0.30	<0.30	<0.30	<0.30	4.93	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Sum of Positive PAHs	mg/kg		0.00	0.00	0.00	0.00	23.58	0.00	0.00	0.00	0.00	0.00	0.00
Benzo(a)pyrene TEQ (Zero)	mg/kg		0.00	0.00	0.00	0.00	2.27	0.00	0.00	0.00	0.00	0.00	0.00
Benzo(a)pyrene TEQ (Half PQL)	mg/kg		0.36	0.36	0.36	0.36	2.42	0.36	0.36	0.36	0.36	0.36	0.36
Benzo(a)pyrene TEQ (PQL)	mg/kg		0.73	0.73	0.73	0.73	2.57	0.73	0.73	0.73	0.73	0.73	0.73
p-Terphenyl-d14 (Surr.)	%		105	102	106	102	99	103	106	128	140	150	137
aldrin	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
a-BHC	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
b-BHC	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
d-BHC	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
g-BHC (lindane)	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
cis-chlordane	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
trans-chlordane	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
4,4'-DDD	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
4,4'-DDE	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
4,4'-DDT	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
dieldrin	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
endosulfan I	mg/kg	0.2			<0.20		<0.20			<0.20		<0.20	
endosulfan II	mg/kg	0.2			<0.20		<0.20			<0.20		<0.20	
endosulfan sulfate	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
endrin	mg/kg	0.2			<0.20		<0.20			<0.20		<0.20	
endrin aldehyde	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	

endrin ketone	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
heptachlor	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
heptachlor epoxide	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
hexachlorobenzene	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
methoxychlor	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
TCMX (Surr.)	%				98		94			112		140	
chlorpyrifos	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
chlorpyrifos methyl	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
diazinon	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
fenchlorphos	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
methyl parathion	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
prophos	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
tributylphosphorotrithioite	mg/kg	0.1			<0.10		<0.10			<0.10		<0.10	
Aroclor 1016	mg/kg	0.5			<0.50		<0.50			<0.50		<0.50	
Aroclor 1221	mg/kg	0.5			<0.50		<0.50			<0.50		<0.50	
Aroclor 1232	mg/kg	0.5			<0.50		<0.50			<0.50		<0.50	
Aroclor 1242	mg/kg	0.5			<0.50		<0.50			<0.50		<0.50	
Aroclor 1248	mg/kg	0.5			<0.50		<0.50			<0.50		<0.50	
Aroclor 1254	mg/kg	0.5			<0.50		<0.50			<0.50		<0.50	
Aroclor 1260	mg/kg	0.5			<0.50		<0.50			<0.50		<0.50	
2-fluorobiphenyl (Surr.)	%				97		93			117		143	
ESA-P-ORG(3,5,6,8)													
>C10-C16	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
>C16-C34	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
>C34-C40	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
>C10-C40 (Sum of total)	mg/kg		0	0	0	0	0	0	0	0	0	0	0
C10-C14	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C15-C28	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C29-C36	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C10-C36 (Sum of total)	mg/kg		0	0	0	0	0	0	0	0	0	0	0

Certificate of Analysis

Sample ID: 2020026615 2020026616

Sample Name DSI-BR1 DSI-BR2

Parameter	Units	PQL		
ESA-P-ORG7 & ORG8				
Benzene	mg/kg	0.5	<0.50	<0.50
Toluene	mg/kg	0.5	<0.50	<0.50
Ethylbenzene	mg/kg	1	<1.0	<1.0
m.p Xylene	mg/kg	2	<2.0	<2.0
o Xylene	mg/kg	1	<1.0	<1.0
Sum of BTEX	mg/kg		0.00	0.00
Total Xylenes	mg/kg		0.0	0.0
Fluorobenzene (Surr.)	%		96	102
C6-C10	mg/kg	35	<35	<35
C6-C10 minus BTEX	mg/kg	35	<35	<35
C6-C9	mg/kg	25	<25	<25
ESA-MP-01,ICP-01				
Arsenic	mg/kg	5	<5.0	<5.0
Cadmium	mg/kg	0.3	<0.30	<0.30
Chromium	mg/kg	5	5.0	8.0
Copper	mg/kg	5	27.8	<5.0
Lead	mg/kg	10	39.5	<10.0
Mercury	mg/kg	0.2	<0.20	<0.20
Nickel	mg/kg	10	<10.0	<10.0
Zinc	mg/kg	5	60.2	<5.0
ESA-P-12				
% Moisture Content	%		5.5	19.9
ESA-P-ORG(11 - 15)				
Acenaphthene	mg/kg	0.3	<0.30	<0.30
Acenaphthylene	mg/kg	0.3	<0.30	<0.30
Anthracene	mg/kg	0.3	<0.30	<0.30
Benzo[a]anthracene	mg/kg	0.3	<0.30	<0.30
Benzo[a]pyrene	mg/kg	0.3	<0.30	<0.30

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 Unit 4/10-11 Millennium Court
 Silverwater 2128
 Ph: (02) 9648-6669

Benzo[b]fluoranthene	mg/kg	0.3	<0.30	<0.30
Benzo[g,h,i]perylene	mg/kg	0.3	<0.30	<0.30
Benzo[k]fluoranthene	mg/kg	0.3	<0.30	<0.30
Chrysene	mg/kg	0.3	<0.30	<0.30
Dibenzo[a,h]anthracene	mg/kg	0.3	<0.30	<0.30
Fluoranthene	mg/kg	0.3	0.38	<0.30
Fluorene	mg/kg	0.3	<0.30	<0.30
Indeno(1,2,3-cd)pyrene	mg/kg	0.3	<0.30	<0.30
Naphthalene	mg/kg	0.3	<0.30	<0.30
Phenanthrene	mg/kg	0.3	<0.30	<0.30
Pyrene	mg/kg	0.3	0.42	<0.30
Sum of Positive PAHs	mg/kg		0.80	0.00
Benzo(a)pyrene TEQ (Zero)	mg/kg		0.00	0.00
Benzo(a)pyrene TEQ (Half PQL)	mg/kg		0.36	0.36
Benzo(a)pyrene TEQ (PQL)	mg/kg		0.73	0.73
p-Terphenyl-d14 (Surr.)	%		144	141
ESA-P-ORG(3,5,6,8)				
>C10-C16	mg/kg	50	<50	<50
>C16-C34	mg/kg	100	<100	<100
>C34-C40	mg/kg	100	<100	<100
>C10-C40 (Sum of total)	mg/kg		0	0
C10-C14	mg/kg	50	<50	<50
C15-C28	mg/kg	100	<100	<100
C29-C36	mg/kg	100	<100	<100
C10-C36 (Sum of total)	mg/kg		0	0

Sydney Laboratory Services - Victoria Branch

A division of A. D. Envirotech Australia Pty Ltd
A.C.N. 093 452 950
Unit 3/55 Chelmsford Street,
Williamstown North, 3068
Ph: (02) 9648-6669



Accreditation No.14664
Accredited for compliance with ISO/IEC 17025 - Testing.

This certificate of analysis contains General Comments and Analytical Results. Quality Control Report and Laboratory Quality Acceptance Criteria have been issued separately.

This report supersedes any previous report(s) with this reference. This document shall not be reproduced, except in full.

This report has been electronically signed by authorised signatories below.

Authorised By

A handwritten signature in blue ink, appearing to read "J Jones", is positioned below the "Authorised By" text.

Jacob Jones

General Comments

Samples are analysed on as received basis. Sampling is not covered by NATA accreditation.

Where moisture determination has been performed, results are reported on dry weight basis.

Where the PQL of reported result differs from standard PQL, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Samples were analysed within holding time described by laboratory internal procedures if not stated otherwise. If samples delivered do not meet required analytical criteria, results will be marked with ^.

However surrogate standards are added to samples, results are not corrected for standards recoveries.

Analysis of VOC in water samples are performed on unfiltered waters (as received) spiked with surrogates and injection standards only.

SLS is responsible for all the information in the report, except that provided by the customer.

All sampling information included in the report has been provided by customer; ADE Consulting Group.

Information provided by ADE Consulting Group can affect the validity of the results.

Certificate of Analysis

Contact:	Mark Potts	Date Reported:	8/12/2020
Customer:	ADE Consulting Group	No. of Samples:	22
Address:	Unit 6 7 Millennium Court Silverwater NSW	Date Received:	7/12/2020
		Date of Analysis:	8/12/2020
Cust Ref:	STC-2151-18730		

Glossary:

- *NATA accreditation does not cover the performance of this service
- ND-not detected,
- NT-not tested
- INS-Insufficient material to perform the test
- LCS-Laboratory Control Sample
- RPD-Relative Percent Difference
- N/A-Not Applicable
- < less than
- > greater than
- PQL- Practical Quantitation Limit
- ^Analytical result might be compromised due to sample condition or holding time requirements
- Reaction rate 1 = Slight
- Reaction rate 2 = Moderate
- Reaction rate 3 = High
- Reaction rate 4 = Vigorous

Certificate of Analysis

Sample ID: 2020026739 2020026740 2020026741 2020026742 2020026743 2020026744 2020026745 2020026746 2020026747 2020026748 2020026749
 Sample Name BH1 (0.5) BH2 (0.3) BH3 (0.9) BH4 (0.2) BH5 (0.5) BH6 (1.0-1.1) BH7 (0.5-0.6) BH8 (0.2-0.3) BH9 (0.3-0.4) BH10 (0.7-0.9) BH11 (0.3-0.4)

Parameter	Units	PQL											
ESA-P-12													
% Moisture Content	%		3.2	8.1	7.9	9.4	7.2	8.6	7.0	7.1	3.7	15.5	5.0
ESA-P-ORG16													
PFBA	ug/kg	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
PFPeA	ug/kg	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
PFBS	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PFHxA	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PFPeS	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PFHpA	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PFOA	ug/kg	1	<1	1	<1	<1	1	<1	<1	<1	<1	<1	<1
PFHpS	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PFOS	ug/kg	1	<1	3	<1	8	4	<1	<1	1	<1	<1	2
PFDA	ug/kg	1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1
PFUdA	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PFDoA	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PFTrDA	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PFTeDA	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PFNA	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PFHxS	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
MPPFA (Surr.)	%		40	30	46	41	63	62	40	60	50	58	74
M3PFBS (Surr.)	%		78	81	76	72	90	75	74	66	77	115	75
MPPFOS (Surr.)	%		0	86	69	66	80	74	87	64	87	101	79
MPPHxA (Surr.)	%		57	54	52	57	62	61	49	53	56	84	55
MPPFOA (Surr.)	%		90	88	88	93	108	92	94	88	107	132	110
MPPFUdA (Surr.)	%		136	140	123	132	115	113	109	107	114	153	114

Certificate of Analysis

Sample ID: 2020026750 2020026751 2020026752 2020026753 2020026754 2020026755 2020026756 2020026757 2020026758 2020026759 2020026760
 Sample Name BH12 (0.7-1.0) BH13 (0.5-0.6) BH14 (0.5-0.6) BH15 (0.2-0.3) BH16 (0.3-0.4) BH17 (0.5-0.8) BH18 (0.3-0.5) BH19 (0.2-0.3) BH20 (0.2-0.4) BH21 (0.2-0.4) BH22 (0.2-0.4)

Parameter	Units	PQL											
ESA-P-12													
% Moisture Content	%		5.0	10.3	12.0	6.8	4.7	7.0	3.9	0.2	4.9	18.9	38.5
ESA-P-ORG16													
PFBA	ug/kg	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
PFPeA	ug/kg	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
PFBS	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PFHxA	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PFPeS	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PFHpA	ug/kg	1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1	<1
PFOA	ug/kg	1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1	3
PFHpS	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PFOS	ug/kg	1	<1	<1	<1	<1	5	<1	11	<1	3	<1	4
PFDA	ug/kg	1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1	<1
PFUdA	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PFDoA	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PFTrDA	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PFTeDA	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PFNA	ug/kg	1	<1	<1	<1	<1	<1	<1	2	<1	<1	<1	<1
PFHxS	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
MPFBA (Surr.)	%		57	39	67	41	34	54	31	40	45	72	22
M3PFBS (Surr.)	%		74	71	76	70	56	81	77	70	91	74	81
MPFOS (Surr.)	%		95	67	77	52	73	75	79	94	89	74	79
MPFHxA (Surr.)	%		65	61	60	53	48	71	62	59	73	67	63
MPFOA (Surr.)	%		103	103	100	94	91	105	89	103	117	111	100
MPFUdA (Surr.)	%		104	95	113	108	102	141	110	118	163	120	119



Sydney Laboratory Services

A division of A. D. Envirotech Australia Pty Ltd
Unit 4/10-11 Millennium Court,
Silverwater 2128
Ph: (02) 9648-6669

A.B.N. 52 093 452 950

Analysis report: STC-2151-18730 ASB 1

Date Received: 03.12.2020
Date Analysed: 10.12.2020
Report Date: 10.12.2020
Client: ADE Consulting Group
Job Location: Arncliffe DSI
Analytical method: AS 4964-2004 "Method for the qualitative identification of asbestos in bulk samples" in conjunction with AD Envirotech's ABI Methods for Polarised Light Microscopy with dispersion staining

Analysis performed by:

A handwritten signature in blue ink that reads 'Sifan Xu'.

Sifan Xu
Approved asbestos identifier

Results Authorised By:

A handwritten signature in blue ink that reads 'Sifan Xu'.

Sifan Xu
Approved Signatory



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025 - Testing.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

General Comments:

Sydney Laboratory Services is responsible for all the information in the report, except that provided by the customer. All sampling information included in the report has been provided by customer; ADE Consulting Group.

Information provided by ADE Consulting Group can affect the validity of the results.

Sample analysed as received.

Samples are stored for minimum period of 1 month if longer time is not advised by client.

Due to the difficulty of estimating the load on the swab the test is carried out for presence or absence of asbestos only.

¹ Independent confirming technique such as infrared spectroscopy, X-ray diffraction, scanning or transmission electron microscopy is advised.

² Due to the sample size not meeting the Australian Standard 4964-2004 requirements, the result might be compromised.



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025 - Testing.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

Client Sample ID.	Laboratory Sample No.	Sample Description/Matrix	Sample Dimensions (cm) unless stated otherwise	Result	Comments
DSI-BH1(0.3)	2020026534	Soil	54 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Synthetic Mineral Fibres found	Nil
				Organic fibres found	Nil
DSI-BH5(0.5)	2020026543	Soil	67 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Synthetic Mineral Fibres found	Nil
				Organic fibres found	Nil
DSI-BH9(0.3-0.4)	2020026550	Soil	55 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Synthetic Mineral Fibres found	Nil
				Organic fibres found	Nil
DSI-BH11(0.3-0.4)	2020026554	Soil	50 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Synthetic Mineral Fibres found	Nil
				Organic fibres found	Nil
DSI-BH13(0.5-0.6)	2020026610	Soil	64 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Synthetic Mineral Fibres found	Nil
				Organic fibres found	Nil
DSI-BH19(0.2-0.3)	2020026569	Soil	58 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Synthetic Mineral Fibres found	Nil
				Organic fibres found	Nil
DSI-BH20(0.2-0.4)	2020026571	Soil	59 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Synthetic Mineral Fibres found	Nil
				Organic fibres found	Nil

Client Sample ID.	Laboratory Sample No.	Sample Description/Matrix	Sample Dimensions (cm) unless stated otherwise	Result	Comments
DSI-BH22(0.2-0.4)	2020026576	Soil	60 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Synthetic Mineral Fibres found	Nil
				Organic fibres found	Nil
DSI-BH21 (0.1-0.2)	2020026611	Soil	60 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Synthetic Mineral Fibres found	Nil
				Organic fibres found	Nil
DSI-BH3(0.5)	2020026612	Soil	59 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Synthetic Mineral Fibres found	Nil
				Organic fibres found	Nil
DSI-BH7(0.2-0.3)	2020026614	Soil	61 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Synthetic Mineral Fibres found	Nil
				Organic fibres found	Nil
DSI-BH17-(0.3-0.5)	2020026613	Soil	63 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
				No Synthetic Mineral Fibres found	Nil
				Organic fibres found	Nil

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Accreditation No.14664
Accredited for compliance with ISO/IEC 17025 - Testing.

This Quality Control Report contains results of QAQC samples analysis and the Laboratory Acceptance Criteria.

This report supersedes any previous report(s) with this reference. This document shall not be reproduced, except in full.

This report has been electronically signed by authorised signatories below.

Authorised By

A handwritten signature in black ink, appearing to read "Jasmine Franco", is positioned below the "Authorised By" text. The signature is fluid and cursive.

Jasmine Franco

General Comments

Duplicate samples and matrix spike may not be prepared on smaller jobs, however are analysed at frequency. QAQC samples shown within the report as e.g. Batch Blank, Batch Matrix Spike were performed on samples not reported on that Certificate of Analysis.

Blank This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in the same manner as for samples.

Duplicate This is the interlaboratory split of a random sample from the processed batch

Matrix Spike A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class.

Surr. (Surrogate Spike) Surrogates are known additions to each sample, blank and matrix spike or LCS in a batch. Surrogates are chosen as a compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Blank shall be < PQL

Matrix Spikes and LCS: Generally 70-130% for inorganics/metals/PFAS, 60-140% for organics is acceptable. Matrix heterogeneity may result in matrix spike analyses falling outside these limits

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the PQL : No Limit

Results between 10-20 times the PQL : RPD must lie between 0-50%

Results >20 times the PQL : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150%

SLS is responsible for all the information in the report, except that provided by the customer.

All sampling information included in the report has been provided by customer; ADE Consulting Group.

Information provided by ADE Consulting Group can affect the validity of the results.

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Quality Control Report

Contact:	Mark Potts	Date Reported:	10/12/2020
Customer:	ADE Consulting Group	No. of Samples:	62
Address:	Unit 6 7 Millennium Court Silverwater NSW	Date Received:	3/12/2020
		Date of Analysis:	3/12/2020
Cust Ref:	STC-2151-18730		

Glossary:

- *NATA accreditation does not cover the performance of this service
- ND-not detected,
- NT-not tested
- INS-Insufficient material to perform the test
- LCS-Laboratory Control Sample
- RPD-Relative Percent Difference
- N/A-Not Applicable
- < less than
- > greater than
- PQL- Practical Quantitation Limit
- ^Analytical result might be compromised due to sample condition or holding time requirements
- Reaction rate 1 = Slight
- Reaction rate 2 = Moderate
- Reaction rate 3 = High
- Reaction rate 4 = Vigorous

Quality Control Report

Sample ID: D202002644902 D202002653502 D202002654402 D202002655504 D202002656403 D202002661503
 Sample Name 65 Norman .TP1.CHEM2 DSI-BH1(0.5) DSI-BH5(0.9) DSI-BH11(0.5-0.6) DSI-BH16(0.3-0.4) DSI-BR1

Parameter	Units	PQL						
ESA-P-ORG(11 - 15)								
Acenaphthene			Pass	Pass	Pass	Pass	Pass	Pass
Acenaphthylene			Pass	Pass	Pass	Pass	Pass	Pass
Anthracene			Pass	Pass	Pass	Pass	Pass	Pass
Benzo[a]anthracene			Pass	Pass	Pass	Pass	Pass	Pass
Benzo[a]pyrene			Pass	Pass	Pass	Pass	Pass	Pass
Benzo[b]fluoranthene			Pass	Pass	Pass	Pass	Pass	Pass
Benzo[g,h,i]perylene			Pass	Pass	Pass	Pass	Pass	Pass
Benzo[k]fluoranthene			Pass	Pass	Pass	Pass	Pass	Pass
Chrysene			Pass	Pass	Pass	Pass	Pass	Pass
Dibenzo[a,h]anthracene			Pass	Pass	Pass	Pass	Pass	Pass
Fluoranthene			Pass	Pass	Pass	Pass	Pass	Pass
Fluorene			Pass	Pass	Pass	Pass	Pass	Pass
Indeno(1,2,3-cd)pyrene			Pass	Pass	Pass	Pass	Pass	Pass
Naphthalene			Pass	Pass	Pass	Pass	Pass	Pass
Phenanthrene			Pass	Pass	Pass	Pass	Pass	Pass
Pyrene			Pass	Pass	Pass	Pass	Pass	Pass
p-Terphenyl-d14	%		113	106	110	107	103	139
aldrin			Pass	Pass	Pass	Pass	Pass	Pass
a-BHC			Pass	Pass	Pass	Pass	Pass	Pass
b-BHC			Pass	Pass	Pass	Pass	Pass	Pass
d-BHC			Pass	Pass	Pass	Pass	Pass	Pass
g-BHC (lindane)			Pass	Pass	Pass	Pass	Pass	Pass
cis-chlordane			Pass	Pass	Pass	Pass	Pass	Pass
trans-chlordane			Pass	Pass	Pass	Pass	Pass	Pass
4,4'-DDD			Pass	Pass	Pass	Pass	Pass	Pass
4,4'-DDE			Pass	Pass	Pass	Pass	Pass	Pass
4,4'-DDT			Pass	Pass	Pass	Pass	Pass	Pass

dieldrin			Pass	Pass	Pass	Pass	Pass	Pass
endosulfan I			Pass	Pass	Pass	Pass	Pass	Pass
endosulfan II			Pass	Pass	Pass	Pass	Pass	Pass
endosulfan sulfate			Pass	Pass	Pass	Pass	Pass	Pass
endrin			Pass	Pass	Pass	Pass	Pass	Pass
endrin aldehyde			Pass	Pass	Pass	Pass	Pass	Pass
endrin ketone			Pass	Pass	Pass	Pass	Pass	Pass
heptachlor			Pass	Pass	Pass	Pass	Pass	Pass
heptachlor epoxide			Pass	Pass	Pass	Pass	Pass	Pass
hexachlorobenzene			Pass	Pass	Pass	Pass	Pass	Pass
methoxychlor			Pass	Pass	Pass	Pass	Pass	Pass
TCMX	%		102	99	99	100	96	131
chlorpyrifos			Pass	Pass	Pass	Pass	Pass	Pass
chlorpyrifos methyl			Pass	Pass	Pass	Pass	Pass	Pass
diazinon			Pass	Pass	Pass	Pass	Pass	Pass
fenchlorphos			Pass	Pass	Pass	Pass	Pass	Pass
methyl parathion			Pass	Pass	Pass	Pass	Pass	Pass
prophos			Pass	Pass	Pass	Pass	Pass	Pass
tributylphosphorotrithioite			Pass	Pass	Pass	Pass	Pass	Pass
Aroclor 1016			Pass	Pass	Pass	Pass	Pass	Pass
Aroclor 1221			Pass	Pass	Pass	Pass	Pass	Pass
Aroclor 1232			Pass	Pass	Pass	Pass	Pass	Pass
Aroclor 1242			Pass	Pass	Pass	Pass	Pass	Pass
Aroclor 1248			Pass	Pass	Pass	Pass	Pass	Pass
Aroclor 1254			Pass	Pass	Pass	Pass	Pass	Pass
Aroclor 1260			Pass	Pass	Pass	Pass	Pass	Pass
2-fluorobiphenyl (Surr.)	%		102	99	99	102	96	134

Sample ID: S202002644802 S202002653402 S202002655404

Sample Name 65 Norman
 .SP1.CHEM1 DSI-BH1(0.3) DSI-BH11(0.3-0.4)

Parameter	Units	PQL			
ESA-P-ORG(11 - 15)					
Acenaphthene	%		135	134	123
Anthracene	%		132	129	120

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Fluoranthene	%		120	119	116
Naphthalene	%		120	119	110
Phenanthrene	%		124	126	113
Pyrene	%		129	128	127
p-Terphenyl-d14 (Surr.)	%		107	103	97
aldrin	%		115	112	101
endrin	%		93	115	85
hexachlorobenzene Recovery	%		104	111	98
TCMX (Surr.)	%		102	103	93
chlorpyrifos	%		108	111	93
diazinon	%		113	115	96
Aroclor 1016	%		104	100	94
2-fluorobiphenyl (Surr.)	%		101	100	92

Sample ID: Q2020008359 Q2020008373 Q2020008387

Sample Name

Parameter	Units	PQL	PCB Blank - Soil	PCB Blank - Soil	PCB Blank - Soil
ESA-P-ORG(11 - 15)					
Acenaphthene	mg/kg	0.3	<0.30	<0.30	<0.30
Acenaphthylene	mg/kg	0.3	<0.30	<0.30	<0.30
Anthracene	mg/kg	0.3	<0.30	<0.30	<0.30
Benzo[a]anthracene	mg/kg	0.3	<0.30	<0.30	<0.30
Benzo[a]pyrene	mg/kg	0.3	<0.30	<0.30	<0.30
Benzo[b]fluoranthene	mg/kg	0.3	<0.30	<0.30	<0.30
Benzo[g,h,i]perylene	mg/kg	0.3	<0.30	<0.30	<0.30
Benzo[k]fluoranthene	mg/kg	0.3	<0.30	<0.30	<0.30
Chrysene	mg/kg	0.3	<0.30	<0.30	<0.30
Dibenzo[a,h]anthracene	mg/kg	0.3	<0.30	<0.30	<0.30
Fluoranthene	mg/kg	0.3	<0.30	<0.30	<0.30
Fluorene	mg/kg	0.3	<0.30	<0.30	<0.30
Indeno(1,2,3-cd)pyrene	mg/kg	0.3	<0.30	<0.30	<0.30
Naphthalene	mg/kg	0.3	<0.30	<0.30	<0.30
Phenanthrene	mg/kg	0.3	<0.30	<0.30	<0.30
Pyrene	mg/kg	0.3	<0.30	<0.30	<0.30

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aldrin	mg/kg	0.1	<0.10	<0.10	<0.10
a-BHC	mg/kg	0.1	<0.10	<0.10	<0.10
b-BHC	mg/kg	0.1	<0.10	<0.10	<0.10
d-BHC	mg/kg	0.1	<0.10	<0.10	<0.10
g-BHC (lindane)	mg/kg	0.1	<0.10	<0.10	<0.10
cis-chlordane	mg/kg	0.1	<0.10	<0.10	<0.10
trans-chlordane	mg/kg	0.1	<0.10	<0.10	<0.10
4,4'-DDD	mg/kg	0.1	<0.10	<0.10	<0.10
4,4'-DDE	mg/kg	0.1	<0.10	<0.10	<0.10
4,4'-DDT	mg/kg	0.1	<0.10	<0.10	<0.10
dieldrin	mg/kg	0.1	<0.10	<0.10	<0.10
endosulfan I	mg/kg	0.2	<0.20	<0.20	<0.20
endosulfan II	mg/kg	0.2	<0.20	<0.20	<0.20
endosulfan sulfate	mg/kg	0.1	<0.10	<0.10	<0.10
endrin	mg/kg	0.2	<0.20	<0.20	<0.20
endrin aldehyde	mg/kg	0.1	<0.10	<0.10	<0.10
endrin ketone	mg/kg	0.1	<0.10	<0.10	<0.10
heptachlor	mg/kg	0.1	<0.10	<0.10	<0.10
heptachlor epoxide	mg/kg	0.1	<0.10	<0.10	<0.10
hexachlorobenzene	mg/kg	0.1	<0.10	<0.10	<0.10
methoxychlor	mg/kg	0.1	<0.10	<0.10	<0.10
chlorpyrifos	mg/kg	0.1	<0.10	<0.10	<0.10
chlorpyrifos methyl	mg/kg	0.1	<0.10	<0.10	<0.10
diazinon	mg/kg	0.1	<0.10	<0.10	<0.10
fenchlorphos	mg/kg	0.1	<0.10	<0.10	<0.10
methyl parathion	mg/kg	0.1	<0.10	<0.10	<0.10
prophos	mg/kg	0.1	<0.10	<0.10	<0.10
tributylphosphorothioite	mg/kg	0.1	<0.10	<0.10	<0.10
Aroclor 1016	mg/kg	0.5	<0.50	<0.50	<0.50
Aroclor 1221	mg/kg	0.5	<0.50	<0.50	<0.50
Aroclor 1232	mg/kg	0.5	<0.50	<0.50	<0.50
Aroclor 1242	mg/kg	0.5	<0.50	<0.50	<0.50
Aroclor 1248	mg/kg	0.5	<0.50	<0.50	<0.50

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Aroclor 1254	mg/kg	0.5	<0.50	<0.50	<0.50
Aroclor 1260	mg/kg	0.5	<0.50	<0.50	<0.50

Sample ID: S202002644804 S202002653404 S202002655403
 Sample Name 65 Norman .SP1.CHEM1 DSI-BH1(0.3) DSI-BH11(0.3-0.4)

Parameter	Units	PQL			
ESA-MP-01,ICP-01					
Arsenic	%		84	87	91
Cadmium	%		92	89	90
Chromium	%		86	90	90
Copper	%		86	95	93
Lead	%		80	89	
Mercury	%		93	97	104
Nickel	%		91	87	89
Zinc	%			96	97

Sample ID: D202002644903 D202002653503 D202002654403 D202002655505 D202002656404 D202002661504
 Sample Name 65 Norman .TP1.CHEM2 DSI-BH1(0.5) DSI-BH5(0.9) DSI-BH11(0.5-0.6) DSI-BH16(0.3-0.4) DS1-BR1

Parameter	Units	PQL						
ESA-P-ORG(3,5,6,8)								
>C10-C16			Pass	Pass	Pass	Pass	Pass	Pass
>C16-C34			Pass	Pass	Pass	Pass	Pass	Pass
>C34-C40			Pass	Pass	Pass	Pass	Pass	Pass
C10-C14			Pass	Pass	Pass	Pass	Pass	Pass
C15-C28			Pass	Pass	Pass	Pass	Pass	Pass
C29-C36			Pass	Pass	Pass	Pass	Pass	Pass

Sample ID: Q2020008358 Q2020008372 Q2020008380
 Sample Name

Parameter	Units	PQL	BTEX Blank Sp-Soil	BTEX Blank Sp-Soil	BTEX Blank Sp-Soil
ESA-P-ORG7 & ORG8					
Benzene	%		100	108	107
Toluene	%		99	101	107
Ethylbenzene	%		96	97	106
m.p Xylene	%		99	100	106

o Xylene	%		96	97	106
Fluorobenzene (Surr.)	%		88	89	91

Sample ID: D202002644901 D202002653501 D202002654401 D202002655502 D202002656402 D202002661502

Sample Name 65 Norman .TP1.CHEM2 DSI-BH1(0.5) DSI-BH5(0.9) DSI-BH11(0.5-0.6) DSI-BH16(0.3-0.4) DS1-BR1

Parameter	Units	PQL						
ESA-P-ORG7 & ORG8								
Benzene			Pass	Pass	Pass	Pass	Pass	Pass
Toluene			Pass	Pass	Pass	Pass	Pass	Pass
Ethylbenzene			Pass	Pass	Pass	Pass	Pass	Pass
m,p Xylene			Pass	Pass	Pass	Pass	Pass	Pass
o Xylene			Pass	Pass	Pass	Pass	Pass	Pass
Fluorobenzene	%		93	100	94	93	97	101
C6-C10			Pass	Pass	Pass	Pass	Pass	Pass
C6-C9			Pass	Pass	Pass	Pass	Pass	Pass

Sample ID: D202002644904 D202002653504 D202002654404 D202002655503 D202002656401 D202002661501

Sample Name 65 Norman .TP1.CHEM2 DSI-BH1(0.5) DSI-BH5(0.9) DSI-BH11(0.5-0.6) DSI-BH16(0.3-0.4) DS1-BR1

Parameter	Units	PQL						
ESA-MP-01,ICP-01								
Arsenic			Pass	Pass	Pass	Pass	Pass	Pass
Cadmium			Pass	Pass	Pass	Pass	Pass	Pass
Chromium			Pass	Pass	Pass	Pass	Pass	Pass
Copper			Pass	Pass	Pass	Pass	Pass	Pass
Lead			Pass	Pass	Pass	Pass	Pass	Pass
Mercury			Pass	Pass	Pass	Pass	Pass	Pass
Nickel			Pass	Pass	Pass	Pass	Pass	Pass
Zinc			Pass	Pass	Pass	Pass	Pass	Pass

Sample ID: Q2020008357 Q2020008371 Q2020008379

Sample Name

Parameter	Units	PQL	BTEX Blank - Soil	BTEX Blank - Soil	BTEX Blank - Soil
ESA-P-ORG7 & ORG8					
Benzene	mg/kg	0.5	<0.50	<0.50	<0.50
Toluene	mg/kg	0.5	<0.50	<0.50	<0.50
Ethylbenzene	mg/kg	1	<1.0	<1.0	<1.0
m.p Xylene	mg/kg	2	<2.0	<2.0	<2.0
o Xylene	mg/kg	1	<1.0	<1.0	<1.0
C6-C10	mg/kg	35	<35	<35	<35
C6-C9	mg/kg	25	<25	<25	<25

Sample ID: S202002662302 S202002662303

Sample Name

Parameter	Units	PQL		
ESA-MP-01,ICP-01				
Lead	%			95
Zinc	%		94	

Sample ID: S202002644801 S202002653401 S202002655402

Sample Name 65 Norman
.SP1.CHEM1 DSI-BH1(0.3) DSI-BH11(0.3-0.4)

Parameter	Units	PQL			
ESA-P-ORG-07 & 08					
Benzene	%		112	102	138
Toluene	%		113	96	138
Ethylbenzene	%		107	92	138
m.p Xylene	%		110	95	137
o Xylene	%		107	92	137
Fluorobenzene Conc.	%		97	83	120

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Sample ID: Q2020008360 Q2020008374 Q2020008388

Sample Name

Parameter	Units	PQL	PCB Blank Sp - Soil	PCB Blank Sp - Soil	PCB Blank Sp - Soil
ESA-P-ORG(11 - 15)					
Acenaphthene	%		131	136	123
Anthracene	%		127	134	119
Fluoranthene	%		118	122	112
Naphthalene	%		120	123	111
Phenanthrene	%		120	126	111
Pyrene	%		126	131	125
p-Terphenyl-d14 (Surr.)	%		108	105	104
aldrin	%		109	116	101
endrin	%		81	101	79
hexachlorobenzene	%		101	114	98
TCMX (Surr.)	%		103	105	99
chlorpyrifos	%		106	109	92
diazinon	%		111	113	94
2-fluorobiphenyl (Surr.)	%		101	101	98
Aroclor 1016	%		110	94	104

Sample ID: Q2020008377 Q2020008383 Q2020008385

Sample Name

Parameter	Units	PQL	Metals Blank - Soil	Metals Blank - Soil	Metals Blank - Soil
ESA-MP-01,ICP-01					
Arsenic	mg/kg	5	<5.0	<5.0	<5.0
Cadmium	mg/kg	0.3	<0.30	<0.30	<0.30
Chromium	mg/kg	5	<5.0	<5.0	<5.0
Copper	mg/kg	5	<5.0	<5.0	<5.0
Lead	mg/kg	10	<10.0	<10.0	<10.0
Mercury	mg/kg	0.2	<0.20	<0.20	<0.20
Nickel	mg/kg	10	<10.0	<10.0	<10.0
Zinc	mg/kg	5	<5.0	<5.0	<5.0

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Sample ID: Q2020008378 Q2020008384 Q2020008386

Sample Name

Parameter	Units	PQL	Metals Blank Sp-Soil	Metals Blank Sp-Soil	Metals Blank Sp-Soil
ESA-MP-01,ICP-01					
Arsenic	%		90	89	94
Cadmium	%		90	90	93
Chromium	%		89	88	91
Copper	%		91	89	93
Lead	%		97	93	99
Mercury	%		105	109	107
Nickel	%		90	88	91
Zinc	%		94	92	96

Sample ID: S202002644803 S202002653403 S202002655405

Sample Name: 65 Norman SP1.CHEM1 DSI-BH1(0.3) DSI-BH11(0.3-0.4)

Parameter	Units	PQL			
ESA-P-ORG(3,5,6,8)					
>C10-C16	%		102	104	109
C10-C14	%		102	104	109

Sample ID: Q2020008361 Q2020008375 Q2020008389

Sample Name

Parameter	Units	PQL	TRH Blank-Soil	TRH Blank-Soil	TRH Blank-Soil
ESA-P-ORG(3,5,6,8)					
>C10-C16	mg/kg	50	<50	<50	<50
>C16-C34	mg/kg	100	<100	<100	<100
>C34-C40	mg/kg	100	<100	<100	<100
C10-C14	mg/kg	50	<50	<50	<50
C15-C28	mg/kg	100	<100	<100	<100
C29-C36	mg/kg	100	<100	<100	<100

Sydney Laboratory Services

A division of A. D. Envirotech Australia Pty Ltd
 Unit 4/10-11 Millennium Court
 Silverwater 2128
 Ph: (02) 9648-6669

Sample ID: Q2020008362 Q2020008376 Q2020008390

Sample Name

Parameter	Units	PQL	TRH Blank Spike- Soil	TRH Blank Spike- Soil	TRH Blank Spike- Soil
ESA-P-ORG(3,5,6,8)					
>C10-C16	%		97	98	104
C10-C14	%		97	98	104

Sydney Laboratory Services - Victoria Branch

A division of A. D. Envirotech Australia Pty Ltd
A.C.N. 093 452 950
Unit 3/55 Chelmsford Street,
Williamstown North, 3016
Ph: (02) 9648-6669



Accreditation No.14664
Accredited for compliance with ISO/IEC 17025 - Testing.

This Quality Control Report contains results of QAQC samples analysis and the Laboratory Acceptance Criteria.

This report supersedes any previous report(s) with this reference. This document shall not be reproduced, except in full.

This report has been electronically signed by authorised signatories below.

Authorised By

A handwritten signature in blue ink that reads 'J Jones'.

Jacob Jones

General Comments

Duplicate samples and matrix spike may not be prepared on smaller jobs, however are analysed at frequency. QAQC samples shown within the report as e.g. Batch Blank, Batch Matrix Spike were performed on samples not reported on that Certificate of Analysis.

Blank This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in the same manner as for samples.

Duplicate This is the interlaboratory split of a random sample from the processed batch

Matrix Spike A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class.

Surr. (Surrogate Spike) Surrogates are known additions to each sample, blank and matrix spike or LCS in a batch. Surrogates are chosen as a compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Blank shall be < PQL

Matrix Spikes and LCS: Generally 70-130% for inorganics/metals/PFAS, 60-140% for organics is acceptable. Matrix heterogeneity may result in matrix spike analyses falling outside these limits

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the PQL : No Limit

Results between 10-20 times the PQL : RPD must lie between 0-50%

Results >20 times the PQL : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150%

SLS is responsible for all the information in the report, except that provided by the customer.

All sampling information included in the report has been provided by customer; ADE Consulting Group.

Information provided by ADE Consulting Group can affect the validity of the results.

Quality Control Report

Contact:	Mark Potts	Date Reported:	8/12/2020
Customer:	ADE Consulting Group	No. of Samples:	5
Address:	Unit 6 7 Millennium Court Silverwater NSW	Date Received:	7/12/2020
		Date of Analysis:	
Cust Ref:	STC-2151-18730		

Glossary:

- *NATA accreditation does not cover the performance of this service
- ND-not detected,
- NT-not tested
- INS-Insufficient material to perform the test
- LCS-Laboratory Control Sample
- RPD-Relative Percent Difference
- N/A-Not Applicable
- < less than
- > greater than
- PQL- Practical Quantitation Limit
- ^Analytical result might be compromised due to sample condition or holding time requirements
- Reaction rate 1 = Slight
- Reaction rate 2 = Moderate
- Reaction rate 3 = High
- Reaction rate 4 = Vigorous

Quality Control Report

Sample ID: D202002674001 D202002674901

Sample Name BH2 (0.3) BH11 (0.3-0.4)

Parameter	Units	PQL		
ESA-P-ORG16				
PFBA			Pass	Pass
PFPeA			Pass	Pass
PFBS			Pass	Pass
PFHxA			Pass	Pass
PFPeS			Pass	Pass
PFHpA			Pass	Pass
PFOA			Pass	Pass
PFHpS			Pass	Pass
PFOS			Pass	Pass
PFDA			Pass	Pass
PFUdA			Pass	Pass
PFDoA			Pass	Pass
PFTrDA			Pass	Pass
PFTeDA			Pass	Pass
PFNA			Pass	Pass
PFHxS			Pass	Pass
MPPFBA	%		26	50
M3PFBS	%		73	116
MPPFOS	%		74	95
MPPFHxA	%		43	86
MPPFOA	%		89	138
MPPFUdA	%		130	152

Sample ID: Q2020008434
 Sample Name: BLANK SPIKE

Parameter	Units	PQL	PFAS LCS Vic- Soil
ESA-P-ORG16			
PFBA	%		109
PFPeA	%		103
PFBS	%		151
PFHxA	%		136
PFPeS	%		131
PFHpA	%		150
PFOA	%		143
PFHpS	%		164
PFOS	%		173
PFDA	%		138
PFUdA	%		175
PFDoA	%		224
PFTTrDA	%		148
PFTeDA	%		233
PFNA	%		110
PFHxS	%		195
MPFBA (Surr.)	%		146
M3PFBS (Surr.)	%		103
MPFOS (Surr.)	%		90
MPFHxA (Surr.)	%		98
MPFOA (Surr.)	%		118
MPFUdA (Surr.)	%		127

Sample ID: Q2020008433

Sample Name BLANK

Parameter	Units	PQL	PFAS MB Vic - Soil
ESA-P-ORG16			
PFBA	ug/kg	4	<4.0
PFPeA	ug/kg	4	<4.0
PFBS	ug/kg	1	<1.0
PFHxA	ug/kg	1	<1.0
PFPeS	ug/kg	1	<1.0
PFHpA	ug/kg	1	<1.0
PFOA	ug/kg	1	<1.0
PFHpS	ug/kg	1	<1.0
PFOS	ug/kg	1	<1.0
PFDA	ug/kg	1	<1.0
PFUdA	ug/kg	1	<1.0
PFDoA	ug/kg	1	<1.0
PFTTrDA	ug/kg	1	<1.0
PFTeDA	ug/kg	1	<1.0
PFNA	ug/kg	1	<1.0
PFHxS	ug/kg	1	<1.0
MPFBA (Surr.)	%		135.211760000000
M3PFBS (Surr.)	%		98.626730000000
MPFOS (Surr.)	%		92.937010000000
MPFHxA (Surr.)	%		98.573800000000
MPFOA (Surr.)	%		122.040600000000
MPFUdA (Surr.)	%		135.424400000000

Sample ID: S202002673901

Sample Name BH1 (0.5)

Parameter	Units	PQL	
ESA-P-ORG16			
PFBA	%		165
PFPeA	%		243
PFBS	%		137
PFHxA	%		131
PFPeS	%		145
PFHpA	%		161
PFOA	%		136
PFHpS	%		193
PFOS	%		171
PFDA	%		120
PFUdA	%		173
PFDoA	%		188
PFTTrDA	%		205
PFTeDA	%		247
PFNA	%		157
PFHxS	%		236
MPFBA (Surr.)	%		23
M3PFBS (Surr.)	%		71
MPFOS (Surr.)	%		89
MPFHxA (Surr.)	%		46
MPFOA (Surr.)	%		79
MPFUdA (Surr.)	%		136



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES2042812

Client	: ADE Consulting Group Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: Mark Potts	Contact	: Shane Ellis
Address	: 6/7 MILLENIUM COURT SILVERWATER NSW 2128	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: mark.potts@ade.group	E-mail	: Shane.Ellis@ALSGlobal.com
Telephone	: ----	Telephone	: +61 2 8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: STC-2151-18730	Page	: 1 of 3
Order number	: 18730	Quote number	: ES2017ADENVT0001 (EN/097/20)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: Jayden Pan		

Dates

Date Samples Received	: 02-Dec-2020 17:40	Issue Date	: 03-Dec-2020
Client Requested Due Date	: 10-Dec-2020	Scheduled Reporting Date	: 10-Dec-2020

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 19.0'C - Ice present
Receipt Detail	: ESKY	No. of samples received / analysed	: 3 / 3

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - S-16 TRH/BTEXN/PAH/OC/OP/PCB/8Metals
ES2042812-002	30-Nov-2020 00:00	DSI - SR1	✓	✓
ES2042812-003	30-Nov-2020 00:00	DSI - SR2	✓	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - W-13 OC/OP/PCB	WATER - W-26 TRH/BTEXN/PAH/8 Metals
ES2042812-001	01-Dec-2020 00:00	Rinsate-01	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



Requested Deliverables

ACCOUNTS ADE

- A4 - AU Tax Invoice (INV) Email accounts@ade.group

INFO ADENVIRO

- *AU Certificate of Analysis - NATA (COA) Email info@adenviro.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email info@adenviro.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email info@adenviro.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email info@adenviro.com.au
- Chain of Custody (CoC) (COC) Email info@adenviro.com.au
- EDI Format - ENMRG (ENMRG) Email info@adenviro.com.au

Jayden Pan

- *AU Certificate of Analysis - NATA (COA) Email jayden.pan@ade.group
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email jayden.pan@ade.group
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email jayden.pan@ade.group
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email jayden.pan@ade.group
- Chain of Custody (CoC) (COC) Email jayden.pan@ade.group
- EDI Format - ENMRG (ENMRG) Email jayden.pan@ade.group
- EDI Format - ESDAT (ESDAT) Email jayden.pan@ade.group

Mark Potts

- *AU Certificate of Analysis - NATA (COA) Email mark.potts@ade.group
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email mark.potts@ade.group
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email mark.potts@ade.group
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email mark.potts@ade.group
- Chain of Custody (CoC) (COC) Email mark.potts@ade.group
- EDI Format - ENMRG (ENMRG) Email mark.potts@ade.group
- EDI Format - ESDAT (ESDAT) Email mark.potts@ade.group

Nadya kako

- *AU Certificate of Analysis - NATA (COA) Email nadya.kako@ade.group
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email nadya.kako@ade.group
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email nadya.kako@ade.group
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email nadya.kako@ade.group
- Chain of Custody (CoC) (COC) Email nadya.kako@ade.group
- EDI Format - ENMRG (ENMRG) Email nadya.kako@ade.group
- EDI Format - ESDAT (ESDAT) Email nadya.kako@ade.group

CERTIFICATE OF ANALYSIS

Work Order : **ES2042812**
Client : **ADE Consulting Group Pty Ltd**
Contact : Mark Potts
Address : 6/7 MILLENIUM COURT
 SILVERWATER NSW 2128

Telephone : ----
Project : STC-2151-18730
Order number : 18730
C-O-C number : ----
Sampler : Jayden Pan
Site : ----
Quote number : EN/097/20
No. of samples received : 3
No. of samples analysed : 3

Page : 1 of 12
Laboratory : Environmental Division Sydney
Contact : Shane Ellis
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164

Telephone : +61 2 8784 8555
Date Samples Received : 02-Dec-2020 17:40
Date Analysis Commenced : 05-Dec-2020
Issue Date : 10-Dec-2020 17:09



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Sample ID		DSI - SR1	DSI - SR2	----	----	----
		Sampling date / time		30-Nov-2020 00:00	30-Nov-2020 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2042812-002	ES2042812-003	-----	-----	-----
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	3.6	10.5	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	5	11	----	----	----
Copper	7440-50-8	5	mg/kg	28	<5	----	----	----
Lead	7439-92-1	5	mg/kg	36	<5	----	----	----
Nickel	7440-02-0	2	mg/kg	<2	<2	----	----	----
Zinc	7440-66-6	5	mg/kg	58	<5	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	----	----	----
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	----	----	----
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	DSI - SR1	DSI - SR2	---	---	---
Sampling date / time				30-Nov-2020 00:00	30-Nov-2020 00:00	---	---	---	
Compound	CAS Number	LOR	Unit	ES2042812-002	ES2042812-003	-----	-----	-----	
				Result	Result	---	---	---	
EP068A: Organochlorine Pesticides (OC) - Continued									
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	---	---	---	
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	---	---	---	
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	---	---	---	
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	---	---	---	
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg	<0.05	<0.05	---	---	---	
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	---	---	---	
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	---	---	---	
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	---	---	---	
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	---	---	---	
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	---	---	---	
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	---	---	---	
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	---	---	---	
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	---	---	---	
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	---	---	---	
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	---	---	---	
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	---	---	---	
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	---	---	---	
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	---	---	---	
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	---	---	---	
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	---	---	---	
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	---	---	---	
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	---	---	---	
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	---	---	---	
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	---	---	---	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	---	---	---	
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	---	---	---	
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	---	---	---	
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	---	---	---	
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	---	---	---	
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	---	---	---	
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	---	---	---	
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	---	---	---	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	DSI - SR1	DSI - SR2	----	----	----
Sampling date / time				30-Nov-2020 00:00	30-Nov-2020 00:00	----	----	----	
Compound	CAS Number	LOR	Unit	ES2042812-002	ES2042812-003	-----	-----	-----	
				Result	Result	----	----	----	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	----	----	
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	----	----	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	----	----	----	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	----	----	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	----	----	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	----	----	
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----	
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	----	----	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	----	----	----	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	----	----	----	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	----	----	----	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	----	----	----	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	----	----	
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	----	----	
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	----	----	
C29 - C36 Fraction	----	100	mg/kg	<100	<100	----	----	----	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	----	----	----	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	----	----	----	
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	----	----	----	
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	----	----	
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	----	----	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	----	----	----	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	----	----	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	----	----	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	----	----	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	----	----	----	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	----	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	DSI - SR1	DSI - SR2	----	----	----
Sampling date / time				30-Nov-2020 00:00	30-Nov-2020 00:00	----	----	----	
Compound	CAS Number	LOR	Unit	ES2042812-002	ES2042812-003	-----	-----	-----	
				Result	Result	----	----	----	
EP080: BTEXN - Continued									
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	----	----	----	
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	----	----	----	
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	----	----	
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%	104	115	----	----	----	
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%	91.5	109	----	----	----	
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%	89.0	72.3	----	----	----	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	97.6	97.9	----	----	----	
2-Chlorophenol-D4	93951-73-6	0.5	%	99.6	91.9	----	----	----	
2,4,6-Tribromophenol	118-79-6	0.5	%	85.5	60.4	----	----	----	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%	97.0	97.6	----	----	----	
Anthracene-d10	1719-06-8	0.5	%	110	91.0	----	----	----	
4-Terphenyl-d14	1718-51-0	0.5	%	106	98.1	----	----	----	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	117	102	----	----	----	
Toluene-D8	2037-26-5	0.2	%	121	105	----	----	----	
4-Bromofluorobenzene	460-00-4	0.2	%	108	97.4	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Rinsate-01	----	----	----	----
Sampling date / time				01-Dec-2020 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	ES2042812-001	-----	-----	-----	-----	
				Result	----	----	----	----	
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----	
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----	
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----	
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----	
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----	
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----	
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----	
EP066: Polychlorinated Biphenyls (PCB)									
^ Total Polychlorinated biphenyls	----	1	µg/L	<1	----	----	----	----	
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.5	µg/L	<0.5	----	----	----	----	
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	----	----	----	----	
beta-BHC	319-85-7	0.5	µg/L	<0.5	----	----	----	----	
gamma-BHC	58-89-9	0.5	µg/L	<0.5	----	----	----	----	
delta-BHC	319-86-8	0.5	µg/L	<0.5	----	----	----	----	
Heptachlor	76-44-8	0.5	µg/L	<0.5	----	----	----	----	
Aldrin	309-00-2	0.5	µg/L	<0.5	----	----	----	----	
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	----	----	----	----	
trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	----	----	----	----	
alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	----	----	----	----	
cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	----	----	----	----	
Dieldrin	60-57-1	0.5	µg/L	<0.5	----	----	----	----	
4,4'-DDE	72-55-9	0.5	µg/L	<0.5	----	----	----	----	
Endrin	72-20-8	0.5	µg/L	<0.5	----	----	----	----	
beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	----	----	----	----	
4,4'-DDD	72-54-8	0.5	µg/L	<0.5	----	----	----	----	
Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	----	----	----	----	
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	----	----	----	----	
4,4'-DDT	50-29-3	2.0	µg/L	<2.0	----	----	----	----	
Endrin ketone	53494-70-5	0.5	µg/L	<0.5	----	----	----	----	
Methoxychlor	72-43-5	2.0	µg/L	<2.0	----	----	----	----	
^ Total Chlordane (sum)	----	0.5	µg/L	<0.5	----	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Rinsate-01	----	----	----	----
Sampling date / time				01-Dec-2020 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	ES2042812-001	-----	-----	-----	-----	
				Result	----	----	----	----	
EP068A: Organochlorine Pesticides (OC) - Continued									
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.5	µg/L	<0.5	----	----	----	----	
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.5	µg/L	<0.5	----	----	----	----	
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.5	µg/L	<0.5	----	----	----	----	
Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	----	----	----	----	
Monocrotophos	6923-22-4	2.0	µg/L	<2.0	----	----	----	----	
Dimethoate	60-51-5	0.5	µg/L	<0.5	----	----	----	----	
Diazinon	333-41-5	0.5	µg/L	<0.5	----	----	----	----	
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	----	----	----	----	
Parathion-methyl	298-00-0	2.0	µg/L	<2.0	----	----	----	----	
Malathion	121-75-5	0.5	µg/L	<0.5	----	----	----	----	
Fenthion	55-38-9	0.5	µg/L	<0.5	----	----	----	----	
Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	----	----	----	----	
Parathion	56-38-2	2.0	µg/L	<2.0	----	----	----	----	
Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	----	----	----	----	
Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	----	----	----	----	
Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	----	----	----	----	
Fenamiphos	22224-92-6	0.5	µg/L	<0.5	----	----	----	----	
Prothiofos	34643-46-4	0.5	µg/L	<0.5	----	----	----	----	
Ethion	563-12-2	0.5	µg/L	<0.5	----	----	----	----	
Carbophenothion	786-19-6	0.5	µg/L	<0.5	----	----	----	----	
Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	----	----	----	----	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----	
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----	
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----	
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----	
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----	
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----	
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----	
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----	
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----	
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	----	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Rinsate-01	----	----	----	----
Sampling date / time				01-Dec-2020 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	ES2042812-001	-----	-----	-----	-----	
				Result	----	----	----	----	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----	
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----	
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----	
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----	
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	----	----	----	----	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	----	----	----	----	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----	
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----	
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----	
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----	
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	----	----	----	
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----	
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----	
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	----	----	----	
EP080: BTEXN									
Benzene	71-43-2	1	µg/L	<1	----	----	----	----	
Toluene	108-88-3	2	µg/L	<2	----	----	----	----	
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----	
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----	
^ Total Xylenes	----	2	µg/L	<2	----	----	----	----	
^ Sum of BTEX	----	1	µg/L	<1	----	----	----	----	
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----	
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	1	%	73.0	----	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Rinsate-01	----	----	----	----
Sampling date / time				01-Dec-2020 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	ES2042812-001	-----	-----	-----	-----	
				Result	----	----	----	----	
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.5	%	80.1	----	----	----	----	
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.5	%	67.0	----	----	----	----	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%	20.8	----	----	----	----	
2-Chlorophenol-D4	93951-73-6	1.0	%	57.1	----	----	----	----	
2,4,6-Tribromophenol	118-79-6	1.0	%	57.6	----	----	----	----	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%	69.5	----	----	----	----	
Anthracene-d10	1719-06-8	1.0	%	82.6	----	----	----	----	
4-Terphenyl-d14	1718-51-0	1.0	%	87.4	----	----	----	----	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%	116	----	----	----	----	
Toluene-D8	2037-26-5	2	%	104	----	----	----	----	
4-Bromofluorobenzene	460-00-4	2	%	105	----	----	----	----	



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	45	134
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	67	111
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	67	111
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

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Work Order : ES2042812
Client : ADE Consulting Group Pty Ltd
Project : STC-2151-18730



Sub-Matrix: WATER		<i>Recovery Limits (%)</i>	
<i>Compound</i>	<i>CAS Number</i>	<i>Low</i>	<i>High</i>
EP080S: TPH(V)/BTEX Surrogates - Continued			

QUALITY CONTROL REPORT

Work Order	: ES2042812	Page	: 1 of 15
Client	: ADE Consulting Group Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: Mark Potts	Contact	: Shane Ellis
Address	: 6/7 MILLENIUM COURT SILVERWATER NSW 2128	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: STC-2151-18730	Date Samples Received	: 02-Dec-2020
Order number	: 18730	Date Analysis Commenced	: 05-Dec-2020
C-O-C number	: ----	Issue Date	: 10-Dec-2020
Sampler	: Jayden Pan		
Site	: ----		
Quote number	: EN/097/20		
No. of samples received	: 3		
No. of samples analysed	: 3		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005(ED093): Total Metals by ICP-AES (QC Lot: 3404923)									
ES2042883-002	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	8	9	17.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	40	46	15.7	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	31	36	16.6	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	6	7	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	706	835	16.8	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	11800	14000	17.0	0% - 20%
ES2042780-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	13	12	9.96	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	2	3	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	6	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	11	10	9.84	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	13	8	40.1	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	26	25	4.21	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3404925)									
ES2042812-002	DSI - SR1	EA055: Moisture Content	----	0.1	%	3.6	4.0	11.0	No Limit
ES2042902-002	Anonymous	EA055: Moisture Content	----	0.1	%	3.7	3.4	10.5	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3404922)									
ES2042780-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.2	0.2	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3401554)									
ES2042812-002	DSI - SR1	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES2042962-008	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3401553)									
ES2042812-002	DSI - SR1	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3401553) - continued									
ES2042812-002	DSI - SR1	EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
EP068: 4.4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit		
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit		
ES2042962-008	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit		
EP068: 4.4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit		



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3401553) - continued									
ES2042962-008	Anonymous	EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 3401553)									
ES2042812-002	DSI - SR1	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit		
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit		
ES2042962-008	Anonymous	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit		
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit		



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3401551)										
ES2042812-002	DSI - SR1	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
			205-82-3							
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit			
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
ES2042962-008	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
			205-82-3							
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit			
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	



Sub-Matrix: **SOIL** Laboratory Duplicate (DUP) Report

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3401552)										
ES2042812-002	DSI - SR1	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit	
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit	
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit	
ES2042962-008	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit	
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit	
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit	
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3403473)										
ES2042812-002	DSI - SR1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit	
ES2042962-009	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3401552)										
ES2042812-002	DSI - SR1	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit	
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit	
ES2042962-008	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit	
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3403473)										
ES2042812-002	DSI - SR1	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit	
ES2042962-009	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit	
EP080: BTEXN (QC Lot: 3403473)										
ES2042812-002	DSI - SR1	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
ES2042962-009	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit	
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
			106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit			
EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit			

Sub-Matrix: **WATER** Laboratory Duplicate (DUP) Report

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 3406632)									
ES2042812-001	Rinsate-01	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 3406632) - continued									
ES2042812-001	Rinsate-01	EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
ES2043337-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.004	0.004	0.00	No Limit
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit		
EG035F: Dissolved Mercury by FIMS (QC Lot: 3406631)									
EP2013464-002	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
ES2043337-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3403005)									
ES2042634-021	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
ES2042896-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3403005)									
ES2042634-021	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
ES2042896-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 3403005)									
ES2042634-021	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
ES2042896-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit



Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3404923)									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	88.1	88.0	113	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	93.4	70.0	130	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	20.2 mg/kg	95.4	68.0	132	
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	101	89.0	111	
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.1 mg/kg	86.7	82.0	119	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.4 mg/kg	88.7	80.0	120	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	162 mg/kg	71.2	66.0	133	
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3404922)									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.073 mg/kg	98.9	70.0	130	
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3401554)									
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	107	62.0	126	
EP068A: Organochlorine Pesticides (OC) (QCLot: 3401553)									
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	88.1	69.0	113	
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	82.1	65.0	117	
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	91.0	67.0	119	
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	83.1	68.0	116	
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	85.3	65.0	117	
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	84.6	67.0	115	
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	94.3	69.0	115	
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	99.2	62.0	118	
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	105	63.0	117	
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	94.5	66.0	116	
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	89.3	64.0	116	
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	106	66.0	116	
EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	88.0	67.0	115	
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.3	67.0	123	
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	96.0	69.0	115	
EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	96.4	69.0	121	
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	91.1	56.0	120	
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	80.9	62.0	124	
EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	94.3	66.0	120	
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	107	64.0	122	
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	91.8	54.0	130	
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3401553)									



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3401553) - continued									
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	91.4	59.0	119	
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	94.0	62.0	128	
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	76.8	54.0	126	
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	106	67.0	119	
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	86.0	70.0	120	
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	88.8	72.0	120	
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	94.7	68.0	120	
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	102	68.0	122	
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	104	69.0	117	
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	104	76.0	118	
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	99.8	64.0	122	
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	104	70.0	116	
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	100	69.0	121	
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	103	66.0	118	
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	103	68.0	124	
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	99.4	62.0	112	
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	80.2	68.0	120	
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	93.7	65.0	127	
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	81.2	41.0	123	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3401551)									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	96.3	77.0	125	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	105	72.0	124	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	100	73.0	127	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	100	72.0	126	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	101	75.0	127	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	96.5	77.0	127	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	94.8	73.0	127	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	92.4	74.0	128	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	91.9	69.0	123	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	95.5	75.0	127	
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	103	68.0	116	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	101	74.0	126	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	97.0	70.0	126	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	94.6	61.0	121	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	90.3	62.0	118	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	91.3	63.0	121	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3401552)									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	104	75.0	129	



Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3401552) - continued									
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	100	77.0	131	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	94.9	71.0	129	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3403473)									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	110	68.4	128	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3401552)									
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	103	77.0	125	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	99.0	74.0	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	77.5	63.0	131	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3403473)									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	106	68.4	128	
EP080: BTEXN (QCLot: 3403473)									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	107	62.0	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	104	67.0	121	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	104	65.0	117	
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	106	66.0	118	
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	106	68.0	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	103	63.0	119	

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EG020F: Dissolved Metals by ICP-MS (QCLot: 3406632)									
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	95.6	85.0	114	
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	93.7	84.0	110	
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	92.8	85.0	111	
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	92.7	81.0	111	
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	93.8	83.0	111	
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	92.3	82.0	112	
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	93.5	81.0	117	
EG035F: Dissolved Mercury by FIMS (QCLot: 3406631)									
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	92.6	83.0	105	
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3401710)									
EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	82.7	68.9	113	
EP068A: Organochlorine Pesticides (OC) (QCLot: 3401709)									
EP068: alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	89.2	64.9	107	
EP068: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	5 µg/L	88.9	58.3	111	
EP068: beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	101	69.0	117	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
EP068A: Organochlorine Pesticides (OC) (QCLot: 3401709) - continued									
EP068: gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	105	70.0	112	
EP068: delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	103	68.9	110	
EP068: Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	99.9	65.2	108	
EP068: Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	101	65.8	109	
EP068: Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	96.2	67.1	107	
EP068: trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	5 µg/L	96.3	64.1	110	
EP068: alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	5 µg/L	93.7	66.7	112	
EP068: cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	5 µg/L	99.2	63.2	111	
EP068: Dieldrin	60-57-1	0.5	µg/L	<0.5	5 µg/L	94.1	65.2	113	
EP068: 4,4'-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	97.8	66.0	112	
EP068: Endrin	72-20-8	0.5	µg/L	<0.5	5 µg/L	92.8	65.2	113	
EP068: beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	5 µg/L	96.0	67.3	114	
EP068: 4,4'-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	95.4	72.0	122	
EP068: Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	5 µg/L	85.9	66.9	109	
EP068: Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	89.0	65.2	112	
EP068: 4,4'-DDT	50-29-3	2	µg/L	<2.0	5 µg/L	90.1	65.2	112	
EP068: Endrin ketone	53494-70-5	0.5	µg/L	<0.5	5 µg/L	92.0	63.8	110	
EP068: Methoxychlor	72-43-5	2	µg/L	<2.0	5 µg/L	92.4	61.1	114	
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3401709)									
EP068: Dichlorvos	62-73-7	0.5	µg/L	<0.5	5 µg/L	85.1	65.6	114	
EP068: Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	5 µg/L	94.7	63.7	113	
EP068: Monocrotophos	6923-22-4	2	µg/L	<2.0	5 µg/L	25.8	19.7	48.0	
EP068: Dimethoate	60-51-5	0.5	µg/L	<0.5	5 µg/L	100	69.5	110	
EP068: Diazinon	333-41-5	0.5	µg/L	<0.5	5 µg/L	87.8	71.1	110	
EP068: Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	5 µg/L	91.2	77.0	119	
EP068: Parathion-methyl	298-00-0	2	µg/L	<2.0	5 µg/L	98.7	70.0	124	
EP068: Malathion	121-75-5	0.5	µg/L	<0.5	5 µg/L	100.0	68.4	116	
EP068: Fenthion	55-38-9	0.5	µg/L	<0.5	5 µg/L	96.0	68.6	112	
EP068: Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	5 µg/L	97.2	75.0	119	
EP068: Parathion	56-38-2	2	µg/L	<2.0	5 µg/L	92.6	67.0	121	
EP068: Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	5 µg/L	93.0	69.0	121	
EP068: Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	5 µg/L	98.8	71.8	110	
EP068: Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	5 µg/L	95.6	67.5	112	
EP068: Fenamiphos	22224-92-6	0.5	µg/L	<0.5	5 µg/L	97.8	64.1	116	
EP068: Prothiofos	34643-46-4	0.5	µg/L	<0.5	5 µg/L	101	67.8	114	
EP068: Ethion	563-12-2	0.5	µg/L	<0.5	5 µg/L	94.6	74.0	120	
EP068: Carbophenothion	786-19-6	0.5	µg/L	<0.5	5 µg/L	99.0	66.2	114	
EP068: Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	5 µg/L	103	51.6	128	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3401708)									



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3401708) - continued									
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	74.2	50.0	94.0	
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	77.9	63.6	114	
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	74.4	62.2	113	
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	79.2	63.9	115	
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	78.0	62.6	116	
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	77.8	64.3	116	
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	81.4	63.6	118	
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	81.1	63.1	118	
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	79.6	64.1	117	
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	80.9	62.5	116	
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	82.6	61.7	119	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	87.6	63.0	115	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	71.1	63.3	117	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	70.3	59.9	118	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	70.0	61.2	117	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	71.8	59.1	118	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3401707)									
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	65.4	55.8	112	
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	90.4	71.6	113	
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	76.8	56.0	121	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3403005)									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	87.5	75.0	127	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3401707)									
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	67.0	57.9	119	
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	73.0	62.5	110	
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	72.9	61.5	121	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3403005)									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	87.2	75.0	127	
EP080: BTEXN (QCLot: 3403005)									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	104	70.0	122	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	96.2	69.0	123	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	98.8	70.0	120	
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	97.5	69.0	121	
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	99.1	72.0	122	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	102	70.0	120	



Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Concentration	Spike Recovery(%) MS	Recovery Limits (%) Low High	
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3404923)							
ES2042780-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	103	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	95.0	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	119	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	104	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	103	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	101	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	107	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3404922)							
ES2042780-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	93.0	70.0	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3401554)							
ES2042812-002	DSI - SR1	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	99.4	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 3401553)							
ES2042812-002	DSI - SR1	EP068: gamma-BHC	58-89-9	0.5 mg/kg	101	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	100	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	105	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	114	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	108	70.0	130
		EP068: 4,4'-DDT	50-29-3	2 mg/kg	82.4	70.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3401553)							
ES2042812-002	DSI - SR1	EP068: Diazinon	333-41-5	0.5 mg/kg	112	70.0	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	96.2	70.0	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	88.9	70.0	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	87.9	70.0	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	92.7	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3401551)							
ES2042812-002	DSI - SR1	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	104	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	98.9	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3401552)							
ES2042812-002	DSI - SR1	EP071: C10 - C14 Fraction	----	523 mg/kg	111	73.0	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	107	53.0	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	106	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3403473)							



Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report				
				Spike	SpikeRecovery(%)	Recovery Limits (%)		
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3403473) - continued								
ES2042812-002	DSI - SR1	EP080: C6 - C9 Fraction	----	32.5 mg/kg	116	70.0	130	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3401552)								
ES2042812-002	DSI - SR1	EP071: >C10 - C16 Fraction	----	860 mg/kg	111	73.0	137	
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	104	53.0	131	
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	99.2	52.0	132	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3403473)								
ES2042812-002	DSI - SR1	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	114	70.0	130	
EP080: BTEXN (QCLot: 3403473)								
ES2042812-002	DSI - SR1	EP080: Benzene	71-43-2	2.5 mg/kg	107	70.0	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	103	70.0	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	108	70.0	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	101	70.0	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	103	70.0	130	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	89.4	70.0	130		

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 3406632)							
ES2042843-003	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	129	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	129	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	125	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	125	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	122	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	128	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	128	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 3406631)							
EP2013464-001	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	92.0	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3403005)							
ES2042634-021	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	108	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3403005)							
ES2042634-021	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	104	70.0	130
EP080: BTEXN (QCLot: 3403005)							
ES2042634-021	Anonymous	EP080: Benzene	71-43-2	25 µg/L	105	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	99.4	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	106	70.0	130

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Sub-Matrix: **WATER**

				<i>Matrix Spike (MS) Report</i>			
				<i>Spike</i>	<i>SpikeRecovery(%)</i>	<i>Recovery Limits (%)</i>	
<i>Laboratory sample ID</i>	<i>Sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Concentration</i>	<i>MS</i>	<i>Low</i>	<i>High</i>
EP080: BTEXN (QCLot: 3403005) - continued							
ES2042634-021	Anonymous	EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	103	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	105	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	106	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2042812	Page	: 1 of 8
Client	: ADE Consulting Group Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: Mark Potts	Telephone	: +61 2 8784 8555
Project	: STC-2151-18730	Date Samples Received	: 02-Dec-2020
Site	: ----	Issue Date	: 10-Dec-2020
Sampler	: Jayden Pan	No. of samples received	: 3
Order number	: 18730	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**



Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	12	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	0	3	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	19	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	12	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	0	3	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	19	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) DSI - SR1, DSI - SR2	30-Nov-2020	----	----	----	07-Dec-2020	14-Dec-2020	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) DSI - SR1, DSI - SR2	30-Nov-2020	07-Dec-2020	29-May-2021	✓	07-Dec-2020	29-May-2021	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) DSI - SR1, DSI - SR2	30-Nov-2020	07-Dec-2020	28-Dec-2020	✓	08-Dec-2020	28-Dec-2020	✓
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066) DSI - SR1, DSI - SR2	30-Nov-2020	05-Dec-2020	14-Dec-2020	✓	08-Dec-2020	14-Jan-2021	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068) DSI - SR1, DSI - SR2	30-Nov-2020	05-Dec-2020	14-Dec-2020	✓	08-Dec-2020	14-Jan-2021	✓



Matrix: **SOIL** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP068B: Organophosphorus Pesticides (OP)							
Soil Glass Jar - Unpreserved (EP068) DSI - SR1, DSI - SR2	30-Nov-2020	05-Dec-2020	14-Dec-2020	✓	08-Dec-2020	14-Jan-2021	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) DSI - SR1, DSI - SR2	30-Nov-2020	05-Dec-2020	14-Dec-2020	✓	08-Dec-2020	14-Jan-2021	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071) DSI - SR1, DSI - SR2	30-Nov-2020	05-Dec-2020	14-Dec-2020	✓	07-Dec-2020	14-Jan-2021	✓
Soil Glass Jar - Unpreserved (EP080) DSI - SR1, DSI - SR2	30-Nov-2020	05-Dec-2020	14-Dec-2020	✓	09-Dec-2020	14-Dec-2020	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP071) DSI - SR1, DSI - SR2	30-Nov-2020	05-Dec-2020	14-Dec-2020	✓	07-Dec-2020	14-Jan-2021	✓
Soil Glass Jar - Unpreserved (EP080) DSI - SR1, DSI - SR2	30-Nov-2020	05-Dec-2020	14-Dec-2020	✓	09-Dec-2020	14-Dec-2020	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) DSI - SR1, DSI - SR2	30-Nov-2020	05-Dec-2020	14-Dec-2020	✓	09-Dec-2020	14-Dec-2020	✓

Matrix: **WATER** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) Rinsate-01	01-Dec-2020	----	----	----	08-Dec-2020	30-May-2021	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) Rinsate-01	01-Dec-2020	----	----	----	08-Dec-2020	29-Dec-2020	✓
EP066: Polychlorinated Biphenyls (PCB)							
Amber Glass Bottle - Unpreserved (EP066) Rinsate-01	01-Dec-2020	07-Dec-2020	08-Dec-2020	✓	09-Dec-2020	16-Jan-2021	✓
EP068A: Organochlorine Pesticides (OC)							
Amber Glass Bottle - Unpreserved (EP068) Rinsate-01	01-Dec-2020	07-Dec-2020	08-Dec-2020	✓	09-Dec-2020	16-Jan-2021	✓
EP068B: Organophosphorus Pesticides (OP)							
Amber Glass Bottle - Unpreserved (EP068) Rinsate-01	01-Dec-2020	07-Dec-2020	08-Dec-2020	✓	09-Dec-2020	16-Jan-2021	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) Rinsate-01	01-Dec-2020	07-Dec-2020	08-Dec-2020	✓	09-Dec-2020	16-Jan-2021	✓

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 Client : ADE Consulting Group Pty Ltd
 Project : STC-2151-18730



Matrix: **WATER** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) Rinsate-01	01-Dec-2020	07-Dec-2020	08-Dec-2020	✓	09-Dec-2020	16-Jan-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) Rinsate-01	01-Dec-2020	09-Dec-2020	15-Dec-2020	✓	09-Dec-2020	15-Dec-2020	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) Rinsate-01	01-Dec-2020	07-Dec-2020	08-Dec-2020	✓	09-Dec-2020	16-Jan-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) Rinsate-01	01-Dec-2020	09-Dec-2020	15-Dec-2020	✓	09-Dec-2020	15-Dec-2020	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) Rinsate-01	01-Dec-2020	09-Dec-2020	15-Dec-2020	✓	09-Dec-2020	15-Dec-2020	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
Analytical Methods							



Matrix: **WATER** Evaluation: ✘ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS	EG035F	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	10	20.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	12	0.00	10.00	✘	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	0	3	0.00	10.00	✘	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	0	1	0.00	10.00	✘	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	19	0.00	10.00	✘	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	10	10.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	3	33.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	10	10.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	3	33.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	10	10.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	12	0.00	5.00	✘	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	0	3	0.00	5.00	✘	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	0	1	0.00	5.00	✘	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	19	0.00	5.00	✘	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3).
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).



Analytical Methods	Method	Matrix	Method Descriptions
Polychlorinated Biphenyls (PCB)	EP066	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
Pesticides by GCMS	EP068	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.

Document Revision Date: 30.06.2020	ESA-F-02 COC - Chain Of Custody (Internal: Sydney Laboratory Services)	ADECONSULTINGGROUP SOLUTIONS THROUGH INNOVATION																						
PROJECT: <u>26-47 Eden Street PSI</u>		LABORATORY REFERENCE NO. (Lab use ONLY): <u>18730</u>																						
PROJECT NUMBER - INVOICE NUMBER	<u>STC-2151-18730</u>																							
SAMPLES DELIVERED BY:	ADE Consulting Group 6/7 Millennium Ct, Silverwater NSW 2128	RECEIVED BY: <u>Mena Kchi</u> SIGNATURE: <u>[Signature]</u>																						
SAMPLERS:	<u>Nadya Katio</u>	SAMPLES: <u>4</u> CHILLED: <input checked="" type="checkbox"/> PRESERVED: <input checked="" type="checkbox"/> PRESERVATION METHOD: <u>N/A</u> CUSTODY SEAL INTACT: <input checked="" type="checkbox"/>																						
TURNAROUND:	24h: <input type="checkbox"/> 48h: <input type="checkbox"/> 72h: <input type="checkbox"/> 5 WORKING DAYS: <input checked="" type="checkbox"/>	MINIMAL HEADSPACE: <input checked="" type="checkbox"/> WITHIN HOLDING TIME: <u>N/A</u>																						
SAMPLING DATE:	<u>30.11.20 / 01.12.20</u>	DATE: <u>3/12/20</u> TIME: <u>10:00</u> TEMPERATURE UPON RECEIPT: <u>°C</u>																						
AFTER TEST STORAGE:	ROOM TEMP: <input type="checkbox"/> FRIDGE: <input checked="" type="checkbox"/> FREEZER: <input type="checkbox"/> >>4 WEEKS: <input type="checkbox"/> OTHER: <input type="checkbox"/>	LIMS LOT NO. <u>2004165</u> LIMS/EXCEL SIGNATURE: <u>[Signature]</u> COMMENTS:																						
REPORT FORMAT:	HARD COPY: <input type="checkbox"/> E-MAIL: <input checked="" type="checkbox"/>	ANALYSES REQUIRED:																						
CONSULTANTS SIGNATURE:	CONSULTANT E-MAIL: <u>nadya.katio@ade-group</u> <u>Jayden.Pan@ade-group</u>	Chem Lab																						
PROJECT MANAGERS SIGNATURE:	PROJECT MANAGERS E-MAIL: <u>Mark.Potts@ade-group</u>	Asbestos																						
SAMPLE DATA		Mould																						
LIMS Sample ID (Lab Use)	Sample ID (ADE)	MATRIX	SAMPLE DATE	TYPE & PRESERVATIVE	NO.	6 Metal Suite	8 Metal Suite	BTEX	PAH	OC/OPP	PCB	VTRH (C6-C10)	TRH (C10-C40)	pH/EC	pH/pH fox	PFAS	Bulk	Dust	Dust Swab	Soil 65g	Soil 500g NEPM	Airborne Asbestos Monitoring	Mould	POTENTIAL HAZARDOUS CONTAMINANTS:
<u>2020026</u>	<u>TB1</u>	<u>Water</u>	<u>30.11.20</u>	<u>U</u>	<u>1</u>			<input checked="" type="checkbox"/>																<input type="checkbox"/> ASBESTOS <input type="checkbox"/> HYDROCARBONS
<u>581</u>	<u>TS1</u>		<u>30.11.20</u>		<u>2</u>			<input checked="" type="checkbox"/>																<input type="checkbox"/> LEAD/ARSENIC <input type="checkbox"/> NO KNOWN CONTAMINATION
<u>582</u>	<u>TB2</u>		<u>01.12.20</u>		<u>3</u>			<input checked="" type="checkbox"/>																<input type="checkbox"/> OTHER: _____
<u>583</u>	<u>TS2</u>		<u>01.12.20</u>		<u>4</u>			<input checked="" type="checkbox"/>																LAB PLEASE *EMAIL COC RECEIPT: <input checked="" type="checkbox"/>
<u>384</u>																								Sample Comments

Comments:
Container Type and Preservative: P = Unpreserved Plastic; PN = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; PNA = Sodium Hydroxide Preserved Plastic; PC = HCl preserved Plastic; VC = Vial HCl Preserved; SP = Sulfuric Preserved Plastic;
VB = Vial Sodium Bisulphate Preserved; VS = Vial Sulfuric Preserved; V = Unpreserved Vial; G = Amber Glass Unpreserved; SG = Sulfuric Preserved Amber Glass; F = Formaldehyde Preserved Glass; HS = HCl preserved Speciation bottle; Z = Zinc Acetate Preserved Bottle;
E = EDTA Preserved Bottle; ST = Sterile Bottle; J = Unpreserved Glass Jar; ASS = Plastic Bag for Acid Sulfate Soils; B = Unpreserved Bag.

COPY

Sydney Laboratory Services

A division of A. D. Envirotech Australia Pty Ltd
A.C.N. 093 452 950
Unit 4/10-11 Millennium Court,
Silverwater 2128
Ph: (02) 9648-6669

Accreditation No.14664
Accredited for compliance with ISO/IEC 17025 - Testing.

SAMPLE RECEIPT NOTIFICATION (SRN)

Contact: Mark Potts
Project name: STC-2151-18730
Number of samples: 4
COC number: STC-2151-18730
Turn around time: 5 Working Days
Date: 03.12.2020
Time received: 7:00 AM
SLS Reference: 2004165
Estimated Report Delivery Date: 10.12.2020

Sample information

- All samples have been received and logged into LIMS.
- No mistakes in the COC
- Samples were chilled
- N/A Samples were preserved
- N/A Custody seal intact
- Samples were delivered within holding time
- Samples to be tested for volatiles had zero headspace
- All samples were received in good condition (no broken jars, labelled correctly...).
- Samples have been subcontracted

Comments

This report contains:

Sample receipt non-conformities
Summary of samples and requested analysis
Requested report deliverables

Contact details

If you have any questions with respect to these samples please contact:
sls@ade.group



Jasmine Franco

Sydney Laboratory Services

A division of A. D. Envirotech Australia Pty Ltd
A.C.N. 093 452 950
Unit 4/10-11 Millennium Court,
Silverwater 2128
Ph: (02) 9648-6669



Accreditation No.14664
Accredited for compliance with
ISO/IEC 17025 - Testing.

Summary of sample(s) and requested analysis

Laboratory Sample ID	Client Sample ID	6 Metal Suite	8 Metal Suite	BTEX	PAH	OCP/OPP	PCB	VTRH	TRH	pH/EC	pH/pH fox	PFAS
2020026581	TB1			X								
2020026582	TS1			X								
2020026583	TB2			X								
2020026584	TS2			X								

Sydney Laboratory Services

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Silverwater 2128
Ph: (02) 9648-6669



Accreditation No.14664
Accredited for compliance with ISO/IEC 17025 - Testing.

This certificate of analysis contains General Comments and Analytical Results. Quality Control Report and Laboratory Quality Acceptance Criteria have been issued separately.

This report supersedes any previous report(s) with this reference. This document shall not be reproduced, except in full.

This report has been electronically signed by authorised signatories below.

Authorised By

A handwritten signature in black ink, appearing to read "Jasmine Franco", is positioned below the "Authorised By" text. The signature is fluid and cursive.

Jasmine Franco

General Comments

Samples are analysed on as received basis. Sampling is not covered by NATA accreditation.

Where moisture determination has been performed, results are reported on dry weight basis.

Where the PQL of reported result differs from standard PQL, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Samples were analysed within holding time described by laboratory internal procedures if not stated otherwise. If samples delivered do not meet required analytical criteria, results will be marked with ^.

However surrogate standards are added to samples, results are not corrected for standards recoveries.

Analysis of VOC in water samples are performed on unfiltered waters (as received) spiked with surrogates and injection standards only.

SLS is responsible for all the information in the report, except that provided by the customer.

All sampling information included in the report has been provided by customer; ADE Consulting Group.

Information provided by ADE Consulting Group can affect the validity of the results.

Certificate of Analysis

Contact:	Mark Potts	Date Reported:	10/12/2020
Customer:	ADE Consulting Group	No. of Samples:	4
Address:	Unit 6 7 Millennium Court Silverwater NSW	Date Received:	3/12/2020
Cust Ref:	STC-2151-18730	Date of Analysis:	3/12/2020

Glossary:

- *NATA accreditation does not cover the performance of this service
- ND-not detected,
- NT-not tested
- INS-Insufficient material to perform the test
- LCS-Laboratory Control Sample
- RPD-Relative Percent Difference
- N/A-Not Applicable
- < less than
- > greater than
- PQL- Practical Quantitation Limit
- ^Analytical result might be compromised due to sample condition or holding time requirements
- Reaction rate 1 = Slight
- Reaction rate 2 = Moderate
- Reaction rate 3 = High
- Reaction rate 4 = Vigorous

Certificate of Analysis

Sample ID: 2020026581 2020026582 2020026583 2020026584

Sample Name TB1 TS1 TB2 TS2

Parameter	Units	PQL				
ESA-P-ORG08 & ORG10						
Benzene	ug/L	1	<1	115%	<1	82%
Toluene	ug/L	1	<1	115%	<1	92%
Ethylbenzene	ug/L	1	<1	113%	<1	97%
m,p Xylene	ug/L	2	<2	112%	<2	97%
o Xylene	ug/L	1	<1	115%	<1	100%
Fluorobenzene (Surr.)	%		92	112	99	108

Sydney Laboratory Services

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Unit 4/10-11 Millennium Court,
Silverwater 2128
Ph: (02) 9648-6669



Accreditation No.14664
Accredited for compliance with ISO/IEC 17025 - Testing.

This Quality Control Report contains results of QAQC samples analysis and the Laboratory Acceptance Criteria.

This report supersedes any previous report(s) with this reference. This document shall not be reproduced, except in full.

This report has been electronically signed by authorised signatories below.

Authorised By

A handwritten signature in black ink, appearing to read 'Jasmine Franco', is positioned below the 'Authorised By' text. The signature is fluid and cursive.

Jasmine Franco

General Comments

Duplicate samples and matrix spike may not be prepared on smaller jobs, however are analysed at frequency. QAQC samples shown within the report as e.g. Batch Blank, Batch Matrix Spike were performed on samples not reported on that Certificate of Analysis.

Blank This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in the same manner as for samples.

Duplicate This is the interlaboratory split of a random sample from the processed batch

Matrix Spike A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class.

Surr. (Surrogate Spike) Surrogates are known additions to each sample, blank and matrix spike or LCS in a batch. Surrogates are chosen as a compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Blank shall be < PQL

Matrix Spikes and LCS: Generally 70-130% for inorganics/metals/PFAS, 60-140% for organics is acceptable. Matrix heterogeneity may result in matrix spike analyses falling outside these limits

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the PQL : No Limit

Results between 10-20 times the PQL : RPD must lie between 0-50%

Results >20 times the PQL : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150%

SLS is responsible for all the information in the report, except that provided by the customer.

All sampling information included in the report has been provided by customer; ADE Consulting Group.

Information provided by ADE Consulting Group can affect the validity of the results.

Quality Control Report

Contact:	Mark Potts	Date Reported:	10/12/2020
Customer:	ADE Consulting Group	No. of Samples:	4
Address:	Unit 6 7 Millennium Court Silverwater NSW	Date Received:	3/12/2020
		Date of Analysis:	3/12/2020
Cust Ref:	STC-2151-18730		

Glossary:

- *NATA accreditation does not cover the performance of this service
- ND-not detected,
- NT-not tested
- INS-Insufficient material to perform the test
- LCS-Laboratory Control Sample
- RPD-Relative Percent Difference
- N/A-Not Applicable
- < less than
- > greater than
- PQL- Practical Quantitation Limit
- ^Analytical result might be compromised due to sample condition or holding time requirements
- Reaction rate 1 = Slight
- Reaction rate 2 = Moderate
- Reaction rate 3 = High
- Reaction rate 4 = Vigorous

Quality Control Report

Sample ID: Q2020008405

Sample Name

Parameter	Units	PQL	BTEX Blank - Water
ESA-P-ORG7 & ORG8			
Benzene	ug/L	1	<1
Toluene	ug/L	1	<1
Ethylbenzene	ug/L	1	<1
m.p Xylene	ug/L	2	<2
o Xylene	ug/L	1	<1

Sample ID: D202002664601

Sample Name LCM 2

Parameter	Units	PQL	
ESA-P-ORG7 & ORG8			
Benzene			Pass
Toluene			Pass
Ethylbenzene			Pass
m.p Xylene			Pass
o Xylene			Pass
Fluorobenzene	%		96

Sample ID: Q2020008406

Sample Name

Parameter	Units	PQL	BTEX Blank Sp-Water
ESA-P-ORG7 & ORG8			
Benzene	%		130
Toluene	%		131
Ethylbenzene	%		128
m.p Xylene	%		127
o Xylene	%		127
Fluorobenzene (Surr.)	%		116

Sample ID: S202002664501

Sample Name LCM 1

Parameter	Units	PQL	
SA-P-ORG08 & ORG10			
Benzene	%		111
Toluene	%		111
Ethylbenzene	%		107
m.p Xylene	%		104
o Xylene	%		106
Fluorobenzene Conc.	%		96

APPENDIX VI - QAQC OUTPUT

Lab Report Number		STC-2151-18730 (534-616)	STC-2151-18730 (534-616)	STC-2151-18730 (534-616)	ES2042812
Field ID		DSI-BH1(0.3)	DSI-BR1	DSI-BH1(0.3)	DSI - SR1
Date		3/12/2020	3/12/2020	3/12/2020	30/11/2020
Matrix Type		soil	soil	soil	soil
		RPD		RPD	
	Unit	EQL			
BTEX					
Benzene	mg/kg	0.2	<0.50	<0.50	0
Toluene	mg/kg	0.5	<0.50	<0.50	0
Ethylbenzene	mg/kg	0.5	<1.0	<1.0	0
Xylene (m & p)	mg/kg	0.5	<2.0	<2.0	0
Xylene (o)	mg/kg	0.5	<1.0	<1.0	0
Xylene Total	mg/kg	0.5	0	0	<0.5
Total BTEX	mg/kg	0.2	0	0	<0.2
TRH					
C6-C10 Fraction (F1)	mg/kg	10	<35	<35	0
C6-C10 (F1 minus BTEX)	mg/kg	10	<35	<35	0
>C10-C16 Fraction (F2)	mg/kg	50	<50	<50	0
>C10-C16 Fraction (F2 minus Naphthalene)	mg/kg	50			<50
>C16-C34 Fraction (F3)	mg/kg	100	<100	<100	0
>C34-C40 Fraction (F4)	mg/kg	100	<100	<100	0
>C10-C40 Fraction (Sum)	mg/kg	50	0	0	<50
Halogenated Benzenes					
Hexachlorobenzene	mg/kg	0.05	<0.10	<0.10	0
Inorganics					
Moisture Content	%	1	4	5.5	32
Metals					
Arsenic	mg/kg	5	<5.0	<5.0	0
Cadmium	mg/kg	0.3	<0.30	<0.30	0
Chromium (III+VI)	mg/kg	2	<5.0	5	5
Copper	mg/kg	5	27.6	27.8	1
Lead	mg/kg	5	38.1	39.5	4
Mercury	mg/kg	0.1	<0.20	<0.20	0
Nickel	mg/kg	2	<10.0	<10.0	0
Zinc	mg/kg	5	61.1	60.2	1
Organochlorine Pesticides					
4,4-DDE	mg/kg	0.05	<0.10	<0.10	0
a-BHC	mg/kg	0.05	<0.10	<0.10	0
Aldrin	mg/kg	0.05	<0.10	<0.10	0
Aldrin + Dieldrin	mg/kg	0.05			<0.05
b-BHC	mg/kg	0.05	<0.10	<0.10	0
Chlordane	mg/kg	0.05			<0.05
Chlordane (cis)	mg/kg	0.05	<0.10	<0.10	0
Chlordane (trans)	mg/kg	0.05	<0.10	<0.10	0
d-BHC	mg/kg	0.05	<0.10	<0.10	0
DDD	mg/kg	0.05	<0.10	<0.10	0
DDT	mg/kg	0.1	<0.10	<0.10	0
DDT+DDE+DDD	mg/kg	0.05			<0.05
Dieldrin	mg/kg	0.05	<0.10	<0.10	0
Endosulfan	mg/kg	0.05			<0.05
Endosulfan I	mg/kg	0.05	<0.20	<0.20	0
Endosulfan II	mg/kg	0.05	<0.20	<0.20	0
Endosulfan sulphate	mg/kg	0.05	<0.10	<0.10	0
Endrin	mg/kg	0.05	<0.20	<0.20	0
Endrin aldehyde	mg/kg	0.05	<0.10	<0.10	0
Endrin ketone	mg/kg	0.05	<0.10	<0.10	0
g-BHC (Lindane)	mg/kg	0.05	<0.10	<0.10	0
Heptachlor	mg/kg	0.05	<0.10	<0.10	0
Heptachlor epoxide	mg/kg	0.05	<0.10	<0.10	0
Methoxychlor	mg/kg	0.1	<0.10	<0.10	0
Organophosphorous Pesticides					
Azinophos methyl	mg/kg	0.05			<0.05
Bromophos-ethyl	mg/kg	0.05			<0.05
Carbophenothion	mg/kg	0.05			<0.05
Chlorfenvinphos	mg/kg	0.05			<0.05
Chlorpyrifos	mg/kg	0.05	<0.10	<0.10	0
Chlorpyrifos-methyl	mg/kg	0.05	<0.10	<0.10	0
Diazinon	mg/kg	0.05	<0.10	<0.10	0
Dichlorvos	mg/kg	0.05			<0.05
Dimethoate	mg/kg	0.05			<0.05
Ethion	mg/kg	0.05			<0.05
Ethoprop	mg/kg	0.1	<0.10	<0.10	0
Fenthion	mg/kg	0.05			<0.05
Malathion	mg/kg	0.05			<0.05
Methyl parathion	mg/kg	0.1	<0.10	<0.10	0
Monocrotophos	mg/kg	0.2			<0.2
Prothiofos	mg/kg	0.05			<0.05
Ronnel	mg/kg	0.1	<0.10	<0.10	0
PAH					
Acenaphthene	mg/kg	0.3	<0.30	<0.30	0
Acenaphthylene	mg/kg	0.3	<0.30	<0.30	0
Anthracene	mg/kg	0.3	<0.30	<0.30	0
Benz(a)anthracene	mg/kg	0.3	<0.30	<0.30	0
Benzo(a) pyrene	mg/kg	0.3	<0.30	<0.30	0
Benzo(b)fluoranthene	mg/kg	0.3	<0.30	<0.30	0
Benzo(b+j)fluoranthene	mg/kg	0.5			<0.5
Benzo(g,h,i)perylene	mg/kg	0.3	<0.30	<0.30	0
Benzo(k)fluoranthene	mg/kg	0.3	<0.30	<0.30	0
Chrysene	mg/kg	0.3	<0.30	<0.30	0
Dibenz(a,h)anthracene	mg/kg	0.3	<0.30	<0.30	0
Fluoranthene	mg/kg	0.3	0.35	0.38	8
Fluorene	mg/kg	0.3	<0.30	<0.30	0
Indeno(1,2,3-c,d)pyrene	mg/kg	0.3	<0.30	<0.30	0
Naphthalene	mg/kg	0.3	<0.30	<0.30	0
Phenanthrene	mg/kg	0.3	<0.30	<0.30	0
Pyrene	mg/kg	0.3	0.38	0.42	10
PAHs (Sum of positives)	mg/kg		0.73	0.8	9
PCBs					
Arochlor 1016	mg/kg	0.5	<0.50	<0.50	0
Arochlor 1221	mg/kg	0.5	<0.50	<0.50	0
Arochlor 1232	mg/kg	0.5	<0.50	<0.50	0
Arochlor 1242	mg/kg	0.5	<0.50	<0.50	0
Arochlor 1248	mg/kg	0.5	<0.50	<0.50	0
Arochlor 1254	mg/kg	0.5	<0.50	<0.50	0
Arochlor 1260	mg/kg	0.5	<0.50	<0.50	0
PCBs (Sum of total)	mg/kg	0.1			<0.1
Pesticides					
DEF	mg/kg	0.1	<0.10	<0.10	0
Demeton-S-methyl	mg/kg	0.05			<0.05
Fenamiphos	mg/kg	0.05			<0.05
Parathion	mg/kg	0.2			<0.2
Pirimphos-ethyl	mg/kg	0.05			<0.05
TPH					
C6-C9 Fraction	mg/kg	10	<25	<25	0
C10-C14 Fraction	mg/kg	50	<50	<50	0
C15-C28 Fraction	mg/kg	100	<100	<100	0
C29-C36 Fraction	mg/kg	100	<100	<100	0
C10-C36 Fraction (Sum)	mg/kg	50	0	0	<50
			Valid Values	74	67
			Invalid Values	1	0

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**Elevated RPDs are highlighted as per QA/QC Profile settings (Acceptable RPDs for each EQL multiplier range are: 81 (1 - 10 x EQL); 50 (10 - 30 x EQL); 30 (> 30 x EQL))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Lab Report Number		STC-2151-18730 (534-616)	STC-2151-18730 (534-616)	STC-2151-18730 (534-616)	ES2042812	
Field ID		DSI-BH6(1.0-1.1)	DSI-BR2	DSI-BH6(1.0-1.1)	DSI - SR2	
Date		3/12/2020	3/12/2020	3/12/2020	30/11/2020	
Matrix Type		soil	soil	soil	soil	
		RPD		RPD		
	Unit	EQL				
BTEX						
Benzene	mg/kg	0.2	<0.50	<0.50	0	
Toluene	mg/kg	0.5	<0.50	<0.50	0	
Ethylbenzene	mg/kg	0.5	<1.0	<1.0	0	
Xylene (m & p)	mg/kg	0.5	<2.0	<2.0	0	
Xylene (o)	mg/kg	0.5	<1.0	<1.0	0	
Xylene Total	mg/kg	0.5	0	0	<0.5	
Total BTEX	mg/kg	0.2	0	0	<0.2	
TRH						
C6-C10 Fraction (F1)	mg/kg	10	<35	<35	0	
C6-C10 (F1 minus BTEX)	mg/kg	10	<35	<35	0	
>C10-C16 Fraction (F2)	mg/kg	50	<50	<50	0	
>C10-C16 Fraction (F2 minus Naphthalene)	mg/kg	50			<50	
>C16-C34 Fraction (F3)	mg/kg	100	<100	<100	0	
>C34-C40 Fraction (F4)	mg/kg	100	<100	<100	0	
>C10-C40 Fraction (Sum)	mg/kg	50	0	0	<50	
Halogenated Benzenes						
Hexachlorobenzene	mg/kg	0.05	<0.10	<0.10	0	
Inorganics						
Moisture Content	%	1	12	19.9	50	
Metals						
Arsenic	mg/kg	5	<5.0	<5.0	0	
Cadmium	mg/kg	0.3	<0.30	<0.30	0	
Chromium (III+VI)	mg/kg	2	7.6	8	5	
Copper	mg/kg	5	<5.0	<5.0	0	
Lead	mg/kg	5	<10.0	<10.0	0	
Mercury	mg/kg	0.1	<0.20	<0.20	0	
Nickel	mg/kg	2	<10.0	<10.0	0	
Zinc	mg/kg	5	<5.0	<5.0	0	
Organochlorine Pesticides						
4,4-DDE	mg/kg	0.05	<0.10	<0.10	0	
a-BHC	mg/kg	0.05	<0.10	<0.10	0	
Aldrin	mg/kg	0.05	<0.10	<0.10	0	
Aldrin + Dieldrin	mg/kg	0.05			<0.05	
b-BHC	mg/kg	0.05	<0.10	<0.10	0	
Chlordane	mg/kg	0.05			<0.05	
Chlordane (cis)	mg/kg	0.05	<0.10	<0.10	0	
Chlordane (trans)	mg/kg	0.05	<0.10	<0.10	0	
d-BHC	mg/kg	0.05	<0.10	<0.10	0	
DDD	mg/kg	0.05	<0.10	<0.10	0	
DDT	mg/kg	0.1	<0.10	<0.10	0	
DDT+DDE+DDD	mg/kg	0.05			<0.05	
Dieldrin	mg/kg	0.05	<0.10	<0.10	0	
Endosulfan	mg/kg	0.05			<0.05	
Endosulfan I	mg/kg	0.05	<0.20	<0.20	0	
Endosulfan II	mg/kg	0.05	<0.20	<0.20	0	
Endosulfan sulphate	mg/kg	0.05	<0.10	<0.10	0	
Endrin	mg/kg	0.05	<0.20	<0.20	0	
Endrin aldehyde	mg/kg	0.05	<0.10	<0.10	0	
Endrin ketone	mg/kg	0.05	<0.10	<0.10	0	
g-BHC (Lindane)	mg/kg	0.05	<0.10	<0.10	0	
Heptachlor	mg/kg	0.05	<0.10	<0.10	0	
Heptachlor epoxide	mg/kg	0.05	<0.10	<0.10	0	
Methoxychlor	mg/kg	0.1	<0.10	<0.10	0	
Organophosphorous Pesticides						
Azinophos methyl	mg/kg	0.05			<0.05	
Bromophos-ethyl	mg/kg	0.05			<0.05	
Carbophenothion	mg/kg	0.05			<0.05	
Chlorfenvinphos	mg/kg	0.05			<0.05	
Chlorpyrifos	mg/kg	0.05	<0.10	<0.10	0	
Chlorpyrifos-methyl	mg/kg	0.05	<0.10	<0.10	0	
Diazinon	mg/kg	0.05	<0.10	<0.10	0	
Dichlorvos	mg/kg	0.05			<0.05	
Dimethoate	mg/kg	0.05			<0.05	
Ethion	mg/kg	0.05			<0.05	
Ethoprop	mg/kg	0.1	<0.10	<0.10	0	
Fenthion	mg/kg	0.05			<0.05	
Malathion	mg/kg	0.05			<0.05	
Methyl parathion	mg/kg	0.1	<0.10	<0.10	0	
Monocrotophos	mg/kg	0.2			<0.2	
Prothiofos	mg/kg	0.05			<0.05	
Ronnel	mg/kg	0.1	<0.10	<0.10	0	
PAH						
Acenaphthene	mg/kg	0.3	<0.30	<0.30	0	
Acenaphthylene	mg/kg	0.3	<0.30	<0.30	0	
Anthracene	mg/kg	0.3	<0.30	<0.30	0	
Benz(a)anthracene	mg/kg	0.3	<0.30	<0.30	0	
Benzo(a) pyrene	mg/kg	0.3	<0.30	<0.30	0	
Benzo(b)fluoranthene	mg/kg	0.3	<0.30	<0.30	0	
Benzo(b+g)fluoranthene	mg/kg	0.5			<0.5	
Benzo(g,h,i)perylene	mg/kg	0.3	<0.30	<0.30	0	
Benzo(k)fluoranthene	mg/kg	0.3	<0.30	<0.30	0	
Chrysene	mg/kg	0.3	<0.30	<0.30	0	
Dibenz(a,h)anthracene	mg/kg	0.3	<0.30	<0.30	0	
Fluoranthene	mg/kg	0.3	<0.30	<0.30	0	
Fluorene	mg/kg	0.3	<0.30	<0.30	0	
Indeno(1,2,3-c,d)pyrene	mg/kg	0.3	<0.30	<0.30	0	
Naphthalene	mg/kg	0.3	<0.30	<0.30	0	
Phenanthrene	mg/kg	0.3	<0.30	<0.30	0	
Pyrene	mg/kg	0.3	<0.30	<0.30	0	
PAHs (Sum of positives)	mg/kg		0	0	0	
PCBs						
Arochlor 1016	mg/kg	0.5	<0.50	<0.50	0	
Arochlor 1221	mg/kg	0.5	<0.50	<0.50	0	
Arochlor 1232	mg/kg	0.5	<0.50	<0.50	0	
Arochlor 1242	mg/kg	0.5	<0.50	<0.50	0	
Arochlor 1248	mg/kg	0.5	<0.50	<0.50	0	
Arochlor 1254	mg/kg	0.5	<0.50	<0.50	0	
Arochlor 1260	mg/kg	0.5	<0.50	<0.50	0	
PCBs (Sum of total)	mg/kg	0.1			<0.1	
Pesticides						
DEF	mg/kg	0.1	<0.10	<0.10	0	
Demeton-S-methyl	mg/kg	0.05			<0.05	
Fenamiphos	mg/kg	0.05			<0.05	
Parathion	mg/kg	0.2			<0.2	
Pirimphos-ethyl	mg/kg	0.05			<0.05	
TPH						
C6-C9 Fraction	mg/kg	10	<25	<25	0	
C10-C14 Fraction	mg/kg	50	<50	<50	0	
C15-C28 Fraction	mg/kg	100	<100	<100	0	
C29-C36 Fraction	mg/kg	100	<100	<100	0	
C10-C36 Fraction (Sum)	mg/kg	50	0	0	<50	
		Valid Values		75	Valid Values	
		Invalid Values		1	Invalid Values	

*RPDs have only been considered where a concentration is greater than 1 tim
 **Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPD
 ***Interlab Duplicates are matched on a per compound basis as methods var

Lab Report Number		ES2042812	
Date		1/12/2020	
Matrix Type		water	
	Unit	EQL	
BTEX			
Benzene	µg/L	1	<1
Toluene	µg/L	2	<2
Ethylbenzene	µg/L	2	<2
Xylene (m & p)	µg/L	2	<2
Xylene (o)	µg/L	2	<2
Xylene Total	µg/L	2	<2
Total BTEX	µg/L	1	<1
TRH			
C6-C10 Fraction (F1)	µg/L	20	<20
C6-C10 (F1 minus BTEX)	µg/L	20	<20
>C10-C16 Fraction (F2)	µg/L	100	<100
>C10-C16 Fraction (F2 minus Naphthalene)	µg/L	100	<100
>C16-C34 Fraction (F3)	µg/L	100	<100
>C34-C40 Fraction (F4)	µg/L	100	<100
>C10-C40 Fraction (Sum)	µg/L	100	<100
Halogenated Benzenes			
Hexachlorobenzene	µg/L	0.5	<0.5
Metals			
Arsenic (filtered)	mg/L	0.001	<0.001
Cadmium (filtered)	mg/L	0.0001	<0.0001
Chromium (III+VI) (filtered)	mg/L	0.001	<0.001
Copper (filtered)	mg/L	0.001	<0.001
Lead (filtered)	mg/L	0.001	<0.001
Mercury (filtered)	mg/L	0.0001	<0.0001
Nickel (filtered)	mg/L	0.001	<0.001
Zinc (filtered)	mg/L	0.005	<0.005
Organochlorine Pesticides			
4,4-DDE	µg/L	0.5	<0.5
a-BHC	µg/L	0.5	<0.5
Aldrin	µg/L	0.5	<0.5
Aldrin + Dieldrin	µg/L	0.5	<0.5
b-BHC	µg/L	0.5	<0.5
Chlordane	µg/L	0.5	<0.5
Chlordane (cis)	µg/L	0.5	<0.5
Chlordane (trans)	µg/L	0.5	<0.5
d-BHC	µg/L	0.5	<0.5
DDD	µg/L	0.5	<0.5
DDT	µg/L	2	<2.0
DDT+DDE+DDD	µg/L	0.5	<0.5
Dieldrin	µg/L	0.5	<0.5
Endosulfan I	µg/L	0.5	<0.5
Endosulfan II	µg/L	0.5	<0.5
Endosulfan sulphate	µg/L	0.5	<0.5
Endrin	µg/L	0.5	<0.5
Endrin aldehyde	µg/L	0.5	<0.5
Endrin ketone	µg/L	0.5	<0.5
g-BHC (Lindane)	µg/L	0.5	<0.5
Heptachlor	µg/L	0.5	<0.5
Heptachlor epoxide	µg/L	0.5	<0.5
Methoxychlor	µg/L	2	<2.0
Organophosphorous Pesticides			
Azinophos methyl	µg/L	0.5	<0.5
Bromophos-ethyl	µg/L	0.5	<0.5
Carbophenothion	µg/L	0.5	<0.5
Chlorfenvinphos	µg/L	0.5	<0.5
Chlorpyrifos	µg/L	0.5	<0.5
Chlorpyrifos-methyl	mg/L	0.0005	<0.0005
Diazinon	µg/L	0.5	<0.5
Dichlorvos	µg/L	0.5	<0.5
Dimethoate	µg/L	0.5	<0.5
Ethion	µg/L	0.5	<0.5
Fenthion	µg/L	0.5	<0.5
Malathion	µg/L	0.5	<0.5
Methyl parathion	µg/L	2	<2.0
Monocrotophos	µg/L	2	<2.0
Prothiofos	µg/L	0.5	<0.5
PAH			
Acenaphthene	µg/L	1	<1.0
Acenaphthylene	µg/L	1	<1.0
Anthracene	µg/L	1	<1.0
Benz(a)anthracene	µg/L	1	<1.0
Benzo(a)pyrene	µg/L	0.5	<0.5
Benzo(b+j)fluoranthene	mg/L	0.001	<0.0010
Benzo(g,h,i)perylene	µg/L	1	<1.0
Benzo(k)fluoranthene	µg/L	1	<1.0
Chrysene	µg/L	1	<1.0
Dibenz(a,h)anthracene	µg/L	1	<1.0
Fluoranthene	µg/L	1	<1.0
Fluorene	µg/L	1	<1.0
Indeno(1,2,3-c,d)pyrene	µg/L	1	<1.0
Naphthalene	µg/L	1	<1.0
Phenanthrene	µg/L	1	<1.0
Pyrene	µg/L	1	<1.0
Benzo(a)pyrene TEQ calc (Zero)	mg/L	0.0005	<0.0005
PAHs (Sum of total)	µg/L	0.5	<0.5
PCBs			
PCBs (Sum of total)	µg/L	1	<1
Pesticides			
Demeton-S-methyl	µg/L	0.5	<0.5
Fenamiphos	µg/L	0.5	<0.5
Parathion	µg/L	2	<2.0
Pirimphos-ethyl	µg/L	0.5	<0.5
TPH			
C6-C9 Fraction	µg/L	20	<20
C10-C14 Fraction	µg/L	50	<50
C15-C28 Fraction	µg/L	100	<100
C29-C36 Fraction	µg/L	50	<50
C10-C36 Fraction (Sum)	µg/L	50	<50
Valid Values		89	
Invalid Values		0	

QA/QC Table 3 -
 Trip Blanks and Trip Spikes

Trip Blanks

Lab Report Number			STC-2151-18730 (581-584)	STC-2151-18730 (581-584)
Date			3/12/2020	3/12/2020
Sample ID			TB1	TB2
Matrix Type			water	water
	Unit	EQL		
BTEX				
Benzene	µg/L	1	<1	<1
Toluene	µg/L	1	<1	<1
Ethylbenzene	µg/L	1	<1	<1
Xylene (m & p)	µg/L	2	<2	<2
Xylene (o)	µg/L	1	<1	<1
Valid Values			5	5
Invalid Values			0	0

Trip Spikes

Lab Report Number			STC-2151-18730 (581-584)	STC-2151-18730 (581-584)
Date			3/12/2020	3/12/2020
Sample ID			TS1	TS2
Matrix Type			water	water
	Unit	EQL		
BTEX				
Benzene	µg/L	1	113	97
Toluene	µg/L	1	112	97
Ethylbenzene	µg/L	1	115	92
Xylene (m & p)	µg/L	2	115	82
Xylene (o)	µg/L	1	115	100
Valid Values			5	5
Invalid Values			0	0

APPENDIX VII - EQUIPMENT CALIBRAITON CERTIFICATES



Calibration and Service Report – PID

Company: A.D. Envirotech Australia Pty Ltr
Contact: Lauren Pugliese
Address:

Manufacturer: Ion Science
Instrument: PHOCHECK TIGER SN:T-1081
Model: TIGER
Configuration: VOC 10.6EV
Wireless:
Network ID:
Unit ID:
Details:

Serial #: T-108116
Asset #:
Part #:
Sold: 18.12.2015
Last Cal: 12.03.2020
Job #: 119669
Cal Spec:
Order #: ADE-16/09/2020

Phone: 1300 796 922

Fax:

Email: Lauren.Pugliese@ade.group

Item	Test	Pass/Fail	Comments	Serial Number
Battery	NiCd, NiMH, Dry cell, Lilon	P		
Charger	Power Supply	P		
	Cradle, Travel Charger	P		
Pump	Flow	P	>200cc/min	
Filter	Filter, fitting, etc	x	Replaced disc filter	
Alarms	Audible, visual, vibration	P		
Display	Operation	P		
Switches	Operation	P		
PCB	Operation	P		
Connectors	Condition	P		
Firmware	Version	P		
Datalogger	Operation	-		
Monitor Housing	Condition	P		
Case	Condition / Type	-		
Sensors				
	PID	Lamp	P	Cleaned
	PID	Sensor	P	Cleaned
	THP	Sensor	P	

Engineer's Report

Cleaned inlet probe, replaced dirty filter; cleaned lamp and electrode
 Checked flowrate and pump stalls
 Checked unit settings and configuration via PC Comm
 Unit serviced and calibrated.



Calibration Certificate

Sensor	Type	Serial No.	Span Gas	Concentration	Traceability Lot #	CF	Reading	
							Zero	Span
Oxygen								
LEL								
PID	10.6eV Lamp	229140263/517295	Isobutylene	100ppm	3075-2-1		0	100
Battery		L-107068						
Toxic 1								
Toxic 2								
Toxic 3								
Toxic 4								
Toxic 5								
Toxic 6								

Calibrated/Repaired by: JERRY JI

Date: 16.09.2020

Next Due: 16.03.2021





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Geotechnical Investigation Report

32 - 42 Eden Street, Arncliffe NSW 2205
Proposed New Development

Prepared for: Billbergia Pty Ltd

STC-2148-18709 v2 | 22.12.2020



ADE
CONSULTING
GROUP

Document Information

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For and on behalf of
ADE Consulting Group Pty Ltd

Prepared by:



Orville Vasquez
 Project Manager /Geotechnical
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Reviewed by:



Janak Patel
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1 Introduction

This Geotechnical Investigation report is submitted to the Department of Planning, Industry and Environment (DPIE) in support of a State Significant Development Application (SSDA-11429726) for the development of land identified at 26-42 Eden Street and 161-179 Princes Highway, Arncliffe (the site) for the purposes of a mixed-use precinct with open space, retail, and residential uses, comprising social and market housing as part of the NSW Land and Housing Corporation (LAHC)’s ‘Communities Plus’ program.

SSDA-11429726 seeks approval for the following development:

- Demolition of all existing buildings and structures on the site;
- Site preparation works, excavation and tree removal;
- The construction of a mixed-use development comprising:
 - o 744 apartments across (4) buildings between 17-21 storeys in height, as follows:
 - 186 market housing apartments in Building A;
 - 202 market housing apartments in Building B;
 - 180 social housing apartments in Building C; and
 - 176 market housing apartments in Building D;
 - o 3,253m² retail gross floor area;
 - o 280m² for a future childcare centre;
 - o 3,706 m² of communal open space;
 - o 813 spaces of lower ground and basement car parking; and
- 4,870m² of publicly accessible open space including a 4,000m² publicly accessible park, and a 870m² public plaza (meeting space), and through site link.

In accordance with section 4.39 of the Environmental Planning & Assessment Act 1979 (EP&A Act), the Secretary’s Environmental Assessment Requirements (SEARs) for SSDA-11429726 were issued on 18 December 2020. This report has been prepared to respond to the following SEAR:

SEAR	(Relevant Item) and Section of report
16. Ground Conditions	(a) Geotechnical

ADE Consulting Group (ADE) was provided with the following information to assist with this geotechnical investigation:

- Geotechnical investigation brief (ref. 201106, dated 6 November 2020) Prepared by Taylor Thomson Whitting (NSW) Pty Ltd (TTW).
- Preliminary architectural drawings (Ref. No. 180319, Drawing Nos. DA 1100, DA 1997 to DA 2023, Issue 1, dated 29 October 2020) prepared by Group GSA Pty Ltd (GSA).
- Detailed survey plan (Ref. 118374500-02, Revision 02, dated 5 July 2017) prepared by Cardno.

Maximum excavations from RL26m to about RL 6.5m, about 19m below existing surface levels will be required to achieve the proposed finished lower basement level, with possible further localised excavation to about 1.5m depth below bulk excavation level for the proposed lift overrun pit. Structural loads have not been supplied and we have assumed typical loadings for this type of development.

The purpose of the investigation was to obtain geotechnical information on subsurface conditions at eight borehole locations as a basis for comments and recommendations on excavation conditions and methodology (rippability), stress relief, vibration issues, shoring, retaining wall parameters, footings, earthquake design parameters, pavements, on-grade floor slabs, and other geotechnical issues associated with the proposed development.

2 Methods of Investigation

The investigation works comprised the drilling of eight boreholes (BH101 to BH108) to depths between 1.0m and 2.5m, using truck mounted drilling rig fitted with spiral augers. All boreholes were subsequently extended to final depths between 16.0m and 25.8m, using rotary diamond coring techniques with water flush.

The borehole locations (refer to Appendix I – Borehole Location Plan) were located as close as practical to the locations agreed by TTW. The borehole locations were set out by taped measurements from apparent site boundaries and existing surface features and were electromagnetically scanned for buried services by a specialist contractor. The surface reduced levels (RLs) shown on the attached borehole logs were determined by interpolation between spot levels and contour lines shown on supplied survey plan, and as such, should be considered approximate. The survey datum is the Australian Height Datum (AHD).

The nature and composition of the subsurface soils and rocks were assessed by logging the materials recovered during drilling. The state of compaction and strength of the subsurface soils were assessed from the Standard Penetration Test (SPT) 'N' values, augmented by the results of hand penetrometer readings on clayey samples recovered in the SPT split tube sampler. In the augered portion of the boreholes, the strength of the sandstone bedrock was assessed by observation of the drilling resistance of a tungsten carbide (TC) bit attached to the auger, together with examination of the recovered rock chip samples and subsequent correlation with laboratory moisture content testing. The strength of the bedrock within the cored portion of the boreholes was assessed by examination of the recovered rock core and subsequent correlation with laboratory point load strength index tests and unconfined compressive strength tests on selected samples.

Groundwater observations were made in the boreholes during auger drilling, on completion of auger drilling and on completion of core drilling. We note that water is used as part of the coring process, and therefore water levels at the completion of coring may not have stabilised in the short time period after drilling. No longer term groundwater monitoring was carried out.

Our geotechnical engineer was present full time during the fieldwork and set out the borehole locations, directed the electromagnetic scanning, nominated insitu testing and sampling, and logged the subsurface profile. The borehole logs (which included groundwater observations) are attached to this report together with the Report Explanation Notes, which describe the investigation techniques adopted and define the logging terms and symbols used.

Selected soil samples were submitted to Sydney Laboratory Services (SLS), a NATA registered laboratory, for moisture content, Atterberg limits and linear shrinkage, standard compaction and four day soaked CBR testing. The recovered rock core was photographed, and selected sections of core were subjected by SLS to Point Load Strength Index testing. The core photographs are presented in Appendix II and the test results are plotted on the relevant log and attached in Appendix III. Representative soil samples were also submitted to ALS Environmental Services, a NATA registered laboratory, for soil pH, sulphate, and chloride testing. The test results have been presented in Appendix III.

3 Site Information

3.1 Site Description

The site area is approximately 1.4 hectares and gently slopes down towards the north-east about 3°. The site itself is irregular in plan shape and is bounded by Princes Highway and Eden Street to the east and west, respectively. A single and multistory residential property are located to the north and south. The site is predominantly located within a residential area and is largely covered by dense vegetation and tall mature trees throughout. Arncliffe Station is approximately 100m beyond to the north.

At the time of investigation, the site was occupied by 14no. 3-storey residential buildings of brick veneer cladding and concrete tiled roofs separated by concrete pathways and large lawn areas. Six asphaltic concrete driveways off Eden Street were located along the western boundary extending to resident car parks.

3.2 Regional Geology

The 1:100,000 Sydney Geological Map indicates that the geology of the site situated within Triassic Hawkesbury Sandstone of the Wianamatta Group.

Hawkesbury Sandstone is described by the map as “medium to coarse grained quartz sandstone, very minor shale and laminate lenses”, while the alluvium is described as “silty to peaty quartz sand, silt and clay”. Figure 1 below shows an excerpt of geological map of Sydney around the site under this investigation.



Figure 1: Excerpt of Geological Map of Sydney 1:100 000 (sourced from NSW Government, Department of Resources and Energy on 11.11.2020)

4 Fieldwork Results

4.1 Subsurface Conditions

Pavements

An asphaltic concrete pavement about 50mm thick overlying 150mm thick road at the surface of BH 101.

Fill

Fill comprising silty sand/sandy clay was encountered in all boreholes and extended down to depths between 0.5m (BH 101, BH 105, and BH 107) and 1.3m (BH 107). Inclusions of igneous gravel and root fibers were encountered in the fill.

Residual Sandy Clay

Residual silty clay of medium and high plasticity and stiff to hard strength was encountered below the fill in each borehole except BH 102 and BH 107. The residual clay was extended down to depths between 1.2m (BH 105) and 2.5m (BH104). The residual silty clays contained a trace of fine to medium grained ironstone gravel.

Weathered Sandstone Bedrock

Weathered sandstone bedrock was encountered in all boreholes below the residual silty clays at depths between 1.0m (BH105) and 2.5m (BH104) below existing grade. The sandstone bedrock was generally distinctly weathered and low to medium strength from first contact improving to slightly weathered to fresh and to medium and high strength with depth. The diamond cored portions of sandstone bedrock encountered defects including sub-horizontal bedding partings, extremely weathered seams, and inclined joints.

Zones of 'core loss' were encountered in BH 101 (0.05m) 2.4m depth, BH 102 (0.11m) 3.89m depth, and BH108 (0.10m) 2.9m depth and are interpreted as representing clay seams or extremely weathered seams which have "washed away" during the coring process.

A preliminary engineering classification of the bedrock (in accordance with Pells et al. 1998) has been carried out and is tabulated below. The classification is based on the cored boreholes and has not taken into account specific footing sizes, pile diameters or founding levels and are therefore only indicative. These preliminary classifications should be reviewed once footing sizes, pile diameters and founding levels have been selected to confirm applicability within the zone of influence of such footings/piles.

See below table for encountered rock classification.

Rock Classification

Note: A preliminary engineering classification of the bedrock (in accordance with Pells et al. 1998) has been carried out and provided below in the table above. The classification is based on the limited number of boreholes and has not taken into account specific footing sizes, pile diameters or founding levels) and are therefore indicative only.

BH CLASS	BH101 Depth/RL (m)	BH102 Depth (m)	BH103 Depth (m)	BH104 Depth (m)	BH105 Depth (m)	BH106 Depth (m)	BH107 Depth (m)	BH108 Depth (m)
V	1.8 – 2.5 (RL 24.2 – 23.5)	-	-	2.5 – 5.3 (RL 20.8 – 18.0)	-	-	-	2.2 – 5.5 (RL 17.1 – 13.8)
IV	2.5 – 5.1 (RL 23.5 – 20.9)	1.4 – 4.0 (RL 26.0 – 23.0)	1.6 – 5.8 (RL 25.3 – 21.1)	5.3 – 8.0 (RL 18.0 – 15.3)	1.2 – 2.0 (RL 21.8 – 21.0)	1.5 – 5.8 (RL 18.8 – 14.7)	1.3 – 10.8 (RL 20.1 – 10.6)	10.5 – 12.2 (RL 8.8 – 7.1)
III	5.1 – 8.3 (RL 20.9 – 17.7) 12.3 – 15.0 (RL 13.7 – 11.0) 19.6 – 21.0 (RL 6.4 – 5.0)	4.0 – 10.5 (RL 23.0 – 16.5) 14.9 – 17.3 (RL 12.1 – 9.7) 20.9 – 23.1 (RL 6.1 – 3.9)	12.3 – 23.8 (RL 14.6 – 3.1)	8.0 – 12.9 (RL 15.3 – 10.4)	2.0 – 14.1 (RL 21.0 – 7.9) 17.6 – 18.1 (RL 5.4 – 4.9)	9.6 – 12.3 (RL 10.7 – 8.0)	-	5.5 – 10.5 (RL 13.8 – 8.8) 12.2 – 16.0 (RL 7.1 – 3.3)
II	8.3 – 12.3 (RL 17.7 – 13.7) 15.0 – 19.6 (RL 11.0 – 6.4)	10.5 – 14.9 (RL 16.5 – 12.1) 17.3 – 20.9 (RL 9.7 – 6.1)	5.8 – 12.3 (RL 21.1 – 14.6) 23.8 – 25.8 (RL 3.1 – 1.1)	12.9 – 17.9 (RL 10.4 – 5.4)	14.1 – 17.6 (RL 7.9 – 5.4)	5.8 – 9.6 (RL 14.7 – 10.7) 12.3 – 17.4 (RL 8.0 – 2.9)	10.8 – 17.8 (RL 10.6 – 3.6)	-
I	-	-	-	-	-	-	-	-

Table 1: Summary of Encountered Rock Classification

4.2 Groundwater

Groundwater observations were made in the boreholes during auger drilling, on completion of auger drilling and on completion of core drilling.

All boreholes were 'dry' during and on completion of auger drilling. Groundwater was recorded at depths between 2.1m and 4.0m on completion of coring. We note that water is introduced during the core drilling process and thus these levels are very likely to have been affected by the introduced drill flush water and are not representative of the "true" groundwater level.

Medium term (1 week after completion) groundwater monitoring was carried out in BH 101, BH 102, BH 104 and BH108 and levels were recorded at 3.0m, 5.1m, 4.1m and 2.2m, respectively. These levels were taken on 1st December 2020 and possibly represent true groundwater levels.

5 Laboratory Test Results

The four-day soaked CBR tests carried out on natural silty clay samples from BH103 and BH105 resulted in a value of 11% and 35%, when compacted to 98% of Standard Maximum Dry Density (SMDD), surcharged with 4.5kg, and soaked for 4 days.

The results of the Point Load Strength Index tests carried out on the recovered rock cores correlated well with our field assessment of bedrock strength, calculated UCS ranged between 1MPa to 46MPa. The estimated UCS tests on rock core samples were carried out and summarised below:

Table 2: Summary of Uniaxial Compressive Strength Test Results

Test Bore	Depth (m)	Soil Description	UCS (MPa)	MC (%)	Wet Density t/m ³	Failure Mechanism
BH 102	10.43 – 10.57	Slightly Weathered Sandstone	8.33	7.0	2.4	Shear
BH 102	19.23 – 19.39	Slightly Weathered Sandstone	25.2	6.5	2.4	Shear
BH103	6.00 – 6.21	Moderately to slightly Weathered Sandstone	24.1	5.4	2.4	Shear
BH 103	15.03 – 15.22	Moderately to slightly Weathered Sandstone	23.4	6.3	2.4	Shear
BH103	19.00 – 19.20	Moderately to slightly Weathered Sandstone	14.2	8.2	2.3	Shear
BH103	25.11 – 25.30	Moderately to slightly Weathered Sandstone	36.5	7.7	2.4	Shear

Note: UCS – Uniaxial Compressive Strength, MC – Moisture Content

The results of the soil chemistry tests are summarised below and show the samples tested to be slightly acidic and to have very low sulphate and chloride contents.

Soil and rock samples were collected from test-pits and boreholes during the field investigation and selected samples were tested for Field moisture content, Atterberg limits with linear shrinkage. The sandy clay assessed to be of low plasticity. The test results are presented in Appendix III.

Table 3: Summary of CBR and Standard Compaction Test Results

Test Bore	Depth (m)	Soil Description	MDD (t/m ³)	OMC (%)	CBR (%) 2.5/5.0 m m
BH 103	1.0 - 1.4	Sandy Clay/Clayey Sand	1.94	13	11
BH 105	0.5 – 1.0	FILLING – Gravelly Sand	1.98	9.0	35

Note: MDD = Maximum dry density, OMC = Standard optimum moisture content

Table 4: Summary of Moisture Content and Atterberg Limits and Linear Shrinkage Test Results

Test Bore	Depth (m)	Soil Description	MC (%)	LL (%)	PL (%)	PI (%)	LS (%)
BH 104	2.0 – 2.1	SANDY CLAY	11.6	32	11	21	5.5
BH 101	0.5 – 1.0	Sandy CLAY	9.5	29	12	17	4

Note: MC = Moisture Content, LL = Liquid limit, PL = Plastic limit, PI = Plasticity index, LS = Linear Shrinkage

Table 5: Summary of Aggressivity Test Results on Soil samples

Test Bore	Depth (m)	Soil Description	pH	SO ₄ (mg/kg)	Cl (mg/kg)	EC (μS/cm)
BH 101	0.5 – 1.0	Sandy CLAY	5.4	90	110	163
BH104	1.0 – 1.5	Sandy CLAY	7.5	<10	60	55
BH104	2.0 – 2.1	Sandy CLAY	7.6	<10	70	62
BH106	2.5 -2.6	Sandy CLAY	6.6	<10	<10	25

6 Comments and Recommendations

6.1 Geotechnical Constraints

Based on the investigation results, we consider the following items to be the primary geotechnical issues associated with the proposed redevelopment:

- The assumed excavation cuts, which will extend to all site boundaries, will require support by shoring walls which will need to be installed prior to the commencement of bulk excavation.
- Design of the retention system will be required to take into account possible surcharge loads from the adjacent buildings to the north-east and south-west, and Princess Highway and Eden Street.
- Demolition and excavation for the proposed redevelopment will need to be carried out carefully due to the presence of neighbouring structures in close proximity of the site boundaries and therefore must be carried out with care so as to not damage, undermine or remove lateral support.
- The standing groundwater levels were recorded during investigation; therefore, allowance must be made for groundwater seepage by appropriate subsurface drainage measures.
- The presence of high strength bedrock at depth which will present “hard” piling conditions and excavation conditions.
- The presence of underground motorway tunnel in the vicinity of site may have constraints for footings, and therefore an accurate location of tunnel may need to be confirmed with the relevant authority. In addition, confirmation should be sought as to any constraints for footing design in proximity to the tunnel.

The above geotechnical issues are addressed in detail in the following sections of this report.

6.2 Demolition and Excavation

6.2.1 General

Extreme care will be required during demolition of existing building on the site including concrete floor slabs due to adjoining neighbouring buildings to the north-east and south-west. There is the potential to damage or de-stabilise neighbouring buildings to the north-west and south-east and may require careful assessment and monitoring during demolition and excavation.

Prior to demolition commencing, detailed dilapidation reports should be compiled on the neighbouring buildings and structures to the north-east and south-west and Princess Highway and Eden Street. Dilapidation surveys of neighbouring structures that fall in the area of influence of the demolition and excavation induced movements and within the extent of possible vibration effects is a necessary part of the process of claim

protection (ie. avoiding spurious claim of damage where, in fact, the damage existed prior to demolition or excavation commencing).

Therefore, we recommend that prior to demolition or excavation commencing, detailed dilapidation reports be compiled on the neighbouring structures to the north and south. The respective owners should be asked to confirm that the dilapidation reports represent a fair record of actual conditions. These reports should be carefully reviewed prior to demolition and excavation commencing to confirm that appropriate equipment is used.

Due to close proximity of neighbouring buildings to the north-east and south-west, we advise that sudden stop/start movements of tracked equipment should be avoided in order to reduce transmission of ground vibrations to neighbouring buildings and structures.

Consequently, we recommend that continuous vibration monitoring of the adjoining buildings be undertaken while the rock breakers are being used to confirm that peak particle velocities fall within acceptable limits. We note that this vibration limit will reduce the risk of vibration damage to the neighbouring building and structures. However, these vibrations may still result in discomfort to occupants of the neighbouring buildings. If excessive vibrations are occurring, it will be necessary to use lower energy equipment. Further recommendations are given in subsequent sections of this report.

6.2.2 Demolition and Excavation Methods

Excavation recommendations provided below should be complemented by reference to the Code of Practice 'Excavation Work', Cat No 312 prepared by Work Cover NSW and by reference to AS3798 'Guidelines on Earthworks for Commercial and Residential Developments'.

Site access constraints are expected to limit the size of plant to be used at the site. On this basis, we expect the demolition and excavations to be completed using medium to large sized hydraulic tracked excavators.

Demolition of concrete footings and floor slabs may well require the use of rock breaker and/or ripping tynes attachments to tracked excavators. Demolition of the concrete slabs adjacent to the north-eastern and south-western site boundary will need to be carried out with care so as not to damage or de-stabilise the neighbouring properties.

We recommend that a saw cut be provided along the perimeter of floor slabs. We expect a saw attachment to the excavator would be used then breaking up of the concrete slabs probably completed using a ripping tynes or possibly a rock breaker attachment. Removal of the concrete pieces can be carried out using a bucket attachment to the tracked excavator. Care will be required to control ground vibrations associated with the use of rock breakers, such as the provision of rock saw cuts or use of rock grinders. If rock saws or rock grinders are used, the resulting dust should be suppressed with water.

The proposed bulk excavation will be approximately 19m below the existing surface levels and will encounter the shallow soil profile and extend into the underlying sandstone bedrock relatively high to very high strength.

The soil cover should be readily excavatable using conventional earthworks equipment (eg. hydraulic excavators, loaders, dozers, etc). Some of the underlying weathered sandstone of extremely or very low strength, (Class V and IV), should also be excavated by bucket excavator, possibly with some ripping. However, we expect that Class III sandstone would be most effectively excavated using a Caterpillar D9L dozer or equivalent, whilst Class II sandstone will require a Caterpillar D10 or D11 dozer or equivalent. Hydraulic impact rock hammers may also be used for effective excavation.

This latter equipment would also be required for breaking up boulders or blocks, for trimming rock excavation side slopes, and for detailed rock excavations, such as for footings or buried services.

The above comments are made so that an appreciation of the rock strength and quality in terms of typical excavatability can be gained. The excavation contractor must make his own assessment on equipment to be used. It should, however, be borne in mind that the equipment to be used may be dictated by vibration limits associated with the neighbouring buildings to the north-east and south-west. Further advice in this regard is presented in Section 6.1.3 below.

6.2.3 Excavation Techniques

We recommend that care be taken during rock excavation on this site and there will likely be direct transmission of ground vibrations to the buildings and structures immediately to the north-east and south-west and to the south-east and north-west across Princes Highway and Eden Street (about 30m away). Prior to excavation commencing, detailed dilapidation reports should be compiled on the neighbouring buildings and structures and the owners asked to confirm that the reports present a fair record of existing conditions. The dilapidation reports may then be used as a benchmark against which to assess possible future claims for damage resulting from the works.

It is generally recommended that continuous vibration monitoring be carried out during rock excavations. Subject to review of the dilapidation reports, vibrations on the neighbouring structures, measured as peak particle velocity, should be limited to no higher than 8mm/sec. We note that this vibration limit is based on structural damage considerations. Lower vibration limits may be necessary, should sensitive equipment or patient comfort in the neighbouring buildings be an issue.

Rock excavations should commence over the higher portion of the site after initially providing a vertical saw cut slot along the perimeter of the excavation. The base of the slot must be maintained at a lower level than the adjoining rock excavation at all times. The use of a rock saw would also provide a 'smooth' cut rock face. Rock excavation with hydraulic rock hammers, if used, should commence using a moderately sized excavator fitted with a moderate energy hydraulic hammer no larger than a Krupp 900 size or equivalent. If it is found that transmitted vibrations are excessive, then it would be necessary to change to a smaller rock hammer or to use alternative excavation techniques. Alternative excavation techniques which will significantly reduce vibrations include a rotary grinder or grid sawing in conjunction with ripping and/or hammering. When using a rock saw or rotary grinder, the resulting dust must be suppressed by spraying with water.

The following procedures are recommended to reduce vibrations if rock hammers are used:

- Maintain rock hammer orientated towards the face and enlarge excavation by breaking small wedges off the face.
- Operate one hammer at a time and in short bursts only, to reduce amplification of vibrations.
- Use excavation contractors with experience in confined work with a competent supervisor who is aware of vibration damage risks, possible rock face instability issues, etc. The contractor should be provided with a copy of this report and have all appropriate statutory and public liability insurances.

6.2.4 Excavation Monitoring

Consideration should be given to the impact of the proposed development upon neighbouring structures, roadways and services. Basement excavation retention systems should be designed so as to limit lateral deflections.

Contractors should also consider the following limits associated with carrying out excavation and construction activities:

- Limit lateral deflection of temporary or permanent retaining structures.
- Limit vertical settlements of ground surface at common property boundaries and services easement.
- Limit Peak Particle Velocities (PPV) from vibrations, caused by construction equipment or excavation, experienced by any nearby structures and services.

Monitoring of deflections of retaining structures and surface settlements should be carried out by a registered surveyor at agreed points along the excavation boundaries and along existing building foundations/ services/ pavements and other structures located within or near the zone of influence of the excavation. Owners of existing services adjacent to the site should be consulted to assess appropriate deflection limits for their infrastructures. Measurements should be taken:

- Prior to commencement of excavations.
- Immediately after installation of any temporary or permanent retaining structures.
- After excavation of each row of supports or anchors, but prior to installation of these supports or anchors.
- Immediately after the excavation has reached bulk excavation level.
- Immediately after backfilling behind retaining structures, (where required); After de-stressing and removal of any row of supports or anchors; and
- One month after completion of permanent retaining structure or after three consecutive measurements not less than a week apart showing no further movements, whichever is the later.

6.2.5 Stress Relief

The site is underlain by sub-horizontally bedded Hawkesbury Sandstone. A characteristic feature of these rocks is that the major and intermediate principal stresses act horizontally and within the depth of interest, are significantly higher than the overburden pressures. The combination of the above leads to lateral displacement of the sides of rock excavations due to stress relief.

Monitoring of several deep excavations within the sandstone in Sydney indicates that the lateral displacement at the top of the excavation is generally 0.5mm to 2mm per meter depth of excavation. Due to the topographic setting of the site, being over the side of a hill slope, we anticipate that the lateral deflection will be in the range 0.5mm to 1mm per meter of excavation depth. For example, for the maximum depth of excavation into sandstone of about 1m, a lateral deflection at the crest of the excavation between 3mm and 6mm can be expected. The lateral deflection is expected to reduce in stepped fashion to zero at bulk excavation level and should be minimal at a horizontal distance of 12m (ie. twice the excavation depth) from the perimeter of the excavation.

6.2.6 Groundwater

Although groundwater seepage within the soil profile was not encountered during auger drilling, however, standing groundwater levels between 2.2m to 5.1m, below existing ground. It is expected that groundwater seepage flows would occur at the soil-rock interface and through joints and bedding planes within the completed cut faces. The seepage volumes may well increase after periods of heavy or prolonged rain.

The initial flows into the excavation may be locally high but would be expected to decrease considerably with time as the bedding seams/joints are drained. We recommend that monitoring of seepage be implemented during the excavation works to confirm the capacity of the drainage system. Seepage, if any, during excavation is expected to be satisfactorily controlled by conventional sump pumping systems. Experience shows that due to the expected low permeability of the bedrock profile, any groundwater inflows into the excavation should not have an adverse impact on the proposed development or on the neighboring sites.

We recommend that a toe drain be formed at the base of all rock cuttings to collect groundwater seepage and lead it to a sump for pumped disposal to the stormwater system.

Groundwater inflow into the bulk excavation must be monitored by site personnel and the results (location, source, volume, etc) be reported to the hydraulic and geotechnical engineers so that any unexpected conditions can be timeously addressed.

In the long term, drainage should be provided behind all basement retaining walls, around the perimeter of the basement and below the basement slab. The completed excavation should be inspected by the hydraulic engineer to confirm that adequate drainage has been allowed for. Drainage should be connected to the sump-and-pump system and discharging into the stormwater system. The permanent groundwater control system should take into account any possible soluble substances in the groundwater which may dictate whether or not groundwater can be pumped into the stormwater system.

The design of drainage and pump systems should take the above issues into account along with careful ongoing inspections and maintenance programs.

6.3 Excavation Support

6.3.1 Temporary Excavation Support

From a geotechnical perspective, it is critical to maintain the stability of the adjacent structures and infrastructures during demolition, excavation and construction works. The feasibility of temporary excavation batters will depend on the three-dimensional geometry in relation to the excavation footprint and level relative to adjacent existing structures. Temporary batter slopes of no steeper than 1 Vertical (V) in 1.5 Horizontal (H) should be adopted in sandy soils and no steeper than 1V in 1H in clay soils and extremely weathered bedrock. Conventional retaining walls may then be constructed at the base of the above temporary batters and subsequently backfilled.

The proposed basement to have a setback between 3m and 5m from the north-eastern and south-western site boundaries. Based on this setback and the proposed excavation depths, and the encountered subsurface conditions, temporary batters are not feasible due to the risk of potential slump failure especially after a period of wet weather. Slumping of the material may result in injury to personnel and/or damage to nearby structures/infrastructures and equipment.

6.3.2 Retention

A suitable retention system could comprise an anchored soldier piled retaining wall, with reinforced shotcrete infill panels. In this regard, we note that temporary anchors are to run below neighbouring properties and permission from the owners is required. If permission is not forthcoming, then the alternative is to provide lateral support by internal bracing or propping or top-down construction will be required.

The shoring system must be installed prior to the commencement of bulk excavation and would need to be anchored, propped and shotcrete progressively, as excavation proceeds. Bored piles appear feasible; however, some allowance for seepage into pile holes should be made and may necessitate pouring of concrete using a tremie method immediately after drilling individual piles. All bored piles should be inspected, cleaned out and be poured using tremie method on the same day as drilling. All pile holes should be cleaned out using a cleaning bucket for effective removal of loose material

We assume that permanent support of the retention system will be provided by bracing from the proposed structure.

The proposed shoring system should be installed to depths which will satisfy stability and founding considerations for all stages of excavation, anchoring and propping. Our preference is for the shoring piles to penetrate below bulk excavation level and be founded uniformly into the underlying weathered bedrock. Shoring piles may also be designed for structural loads.

Alternatively, the shoring piles installed into at least medium strength rock with the provision of rock bolting at the toe of the piles to provide lateral support. We expect that Class III or better sandstone may be cut vertically using rock saw (i.e., will be self-supporting over the long term). However, localised stabilisation measures may be necessary if adverse defects (such as inclined joints or bedding) are found. Treatment for zones requiring stabilisation may include rock bolting, shotcreting, underpinning, etc. Clay seams occurring in permanently exposed sandstone slopes may require 'dental' treatment.

The excavated rock face be progressively inspected by an experienced geotechnical engineer/engineering geologist as excavation proceeds (at no more than 1.5m vertical intervals) to identify adverse defects and to propose appropriate stabilisation measures. We note that the extent of stabilisation measures which may be required can only be finalised during the above inspections. However, based on the investigation results, it would appear that the stabilisation measures which will be required will be of limited extent. Provision must be made in the contract documents (budget and program) for the above inspections and possible stabilisation measures.

Bored piers with the provision of steel casing into the soil profile may be used for this site. However, relatively large capacity piling rigs (e.g. Soilmec SR-30 or larger) will be required for drilling through the sandstone bedrock. The proposed pile locations should take into account the presence of buried services. Further advice should be sought from prospective piling contractors who should be provided with a copy of this report.

Working platforms may also be required. We can complete the design of the working platform, if commissioned to do so.

As mentioned above, Pacific Highway is an RMS asset. RMS may require an assessment of the potential impact of the proposed development on their asset using computer modelling. In addition, monitoring of RMS asset, using inclinometers, during excavation works may also be required. We can complete the modelling, monitoring plan together with inclinometers installation and monitoring during construction, if commissioned to do so.

6.3.3 Retaining Walls Parameters

The following parameters may be used for design of temporary and permanent retaining walls at the subject site:

- Conventional free-standing cantilever walls supporting areas where movement is of little concern (i.e. where only garden or grassed areas are to be retained), may be designed for a triangular lateral earth pressure distribution and an 'active' earth pressure coefficient, K_a , of 0.33, for the soil profile and Class V rock, assuming a horizontal retained surface.
- Free-standing cantilever walls, the tops of which are restrained by the floor slabs of the permanent structure or where movement sensitive elements are being retained, should be designed for a triangular lateral earth pressure distribution and an 'at rest' earth pressure coefficient, K_o , of 0.55, for the soil profile and Class V rock, assuming a horizontal retained surface.
- A bulk unit weight of 20kN/m^3 should be adopted for the soil profile and Class V rock.
- For progressively anchored or propped walls where minor movements can be tolerated (provided there are no buried movement sensitive services), we recommend the use of a trapezoidal earth pressure distribution of $5H$ kPa for soil and sandstone bedrock, where H is the retained height in meters. These pressures should be assumed to be uniform over the central 50% of the support system, tapering to nil at top and bottom.
- For progressively anchored or propped walls which support areas which are highly sensitive to movement (such as areas where movement sensitive structures or infrastructures or buried services are located in close proximity), we recommend the use of a trapezoidal earth pressure distribution of $8H$ kPa for soil and sandstone bedrock, where 'H' is the retained height in meters. These pressures should be assumed to be uniform over the central 50% of the support system, tapering to nil at top and bottom.
- The retaining walls should be designed as drained and measures are to be taken to provide complete and permanent drainage behind the walls. Strip drains protected with a non-woven geotextile fabric should be used behind the shotcrete infill panels for soldier pile walls or inserted between gaps in contiguous piles. Alternatively, for the contiguous pile walls, weepholes comprising 20mm diameter PVC pipes grouted into holes or gaps between adjacent piles at 1.5m centres (horizontal and vertical), may be used. The embedded end of the pipes must, however, be wrapped with a non-woven geotextile fabric (such as Bidim A34) to act as a filter against subsoil erosion.
- All surcharge loading affecting the walls (including from construction equipment, construction loads, adjacent high-level footings, etc.) should be adopted in the retaining wall design as an additional surcharge using 'at rest' earth pressure coefficient, K_o , of 0.55;
- Lateral toe restraint may be achieved by keying the wall into bedrock below bulk excavation level. An allowable lateral stress of 300kPa may be adopted for key design subject to inspection by geotechnical engineer.
- Alternatively, for footings founded in bedrock above bulk excavation level, the wall footing should be laterally restraint using rock bolts. The rock bolts should be grouted into holes drilled down and away from the cut face and provided with a cogged end to engage with the footing reinforcing. The rock bolts should be designed for an allowable bond stress of 150kPa and should be provided with corrosion protection for long term durability.

- If temporary anchors extend beyond the site boundaries, then permission from the neighbouring properties would need to be obtained prior to installation. Also, the presence of neighbouring basements and/or services and their levels must be confirmed prior to finalizing anchor design.
- Anchors should have their bond length within Class IV or better, the allowable bond stress value 400kPa may be used, subject to the following conditions:
 - a. Anchor bond lengths of at least 3m behind the ‘active’ zone of the excavation (taken as a 45° zone above the base of the excavation) is provided.
 - b. Overall stability, including anchor group interaction, is satisfied.
 - c. All anchors should be proof loaded to at least 1.33 times the design working load before locked off at working load. Such proof loading is to be witnessed by an engineer independent of the anchoring contractor. We recommend that only experienced contractors be considered for anchor installation with appropriate insurances.
 - d. If permanent anchors are to be used, these must have appropriate corrosion provisions for longevity.

Table 6: Allowable Bond Stress in Sandstone

Material	Allowable Bond Stress
Low strength Class IV Sandstone	250 kPa
Medium strength - Class III Sandstone	350 kPa
Medium to high strength - Class II Sandstone	800 kPa

These values should be confirmed by a pull-out test prior to installation of anchors.

6.4 Foundations

6.4.1 Footings

Based on the results of the cored boreholes, Class III sandstone bedrock is expected to be revealed at bulk excavation levels. Based on the above, pad footings founded in Class III sandstone bedrock may be designed using a maximum allowable bearing pressure of 6,000kPa.

Where the proposed footings are founded close to a vertical rock face or adjacent to lift shafts, the allowable bearing pressure below these footings will need to be carefully assessed. The safe bearing pressure would need to take into account rock strength, jointing and the influence of clayey seams, etc. as well as the magnitude and inclination of the applied loadings. Inspection by a geotechnical engineer of each footing affected rock area should be requested to assess its quality and make judgement on final design pressure.

Spoon testing of at least 30% of all pad footings designed for an allowable end bearing pressure of 6,000kPa should be completed to confirm bedrock quality and/or presence of poor-quality layers within the underlying bedrock. If such layers are revealed during spoon testing of footing locations, then the geotechnical engineer may request that either the footings go deeper to penetrate the layers or there be an increase in the plan area of pad or strip footings. Some allowance should be made for these types of variations. Alternatively, if only 3500kPa is adopted then only a visual inspection of the base of the excavated footings will be required to confirm that the designed bearing pressures have been achieved.

The designer may wish to adopt the limit state design methods. An ultimate bearing value of 40MPa should be used for the Class III sandstone together with a Young's Modulus value of 1200MPa. A geotechnical strength reduction factor, ϕ_g of 0.6 should be adopted.

The above foundation design parameters assume that shallow footings are clean at the base and free of loose debris prior to steel and concrete placement. Furthermore, it is recommended that all footings be inspected by an experienced geotechnical engineer or engineering geologist.

6.4.2 On-Grade Floor Slab

The lower basement on-grade floor slab will directly overlie bedrock. We therefore recommend that underfloor drainage be provided. The underfloor drainage should comprise a strong, durable, single-sized washed aggregate (eg. 'blue metal' gravel) and should connect with the wall drains and lead groundwater seepage to a sump for pumped discharge to the stormwater system. The underfloor drainage may comprise a blanket drain or a drain installed into slots which are cut into the rock subgrade.

Permission may need to be obtained from the NSW Department of Primary Industries (DPI) and possibly Council for any permanent discharge of seepage into the drainage system. Given the subsurface conditions, we expect that seepage volumes would be low and within the DPI limits. However, if permission for discharge is not obtained, the basement may need to be designed as a tanked basement.

Joints in the concrete on-grade floor slab should be designed to accommodate shear forces but not bending moments by using dowelled or keyed joints.

6.5 External Pavements

6.5.1 Subgrade Preparation

Subgrade preparation for proposed pavement areas may require removal of a number of trees. Stripping of vegetation and root-affected soil will also be required. Following this, any obvious deleterious or contaminated existing fill should be removed. These stripped materials should be taken off site as they are not suitable for re-use as engineered fill. Reference should be made to the environmental report for comments on off-site disposal of soils.

The site should then be excavated to suit the design subgrade levels for the pavement.

The exposed subgrade should then be proof rolled with a 8 tonne minimum deadweight smooth drum vibratory roller. Proof-rolling should be carried out under the direction of an experienced earthworks superintendent or geotechnical engineer to assist in the detection of unstable areas which were not disclosed by this investigation.

Any unstable areas identified during proof-rolling should be locally excavated down to a competent base and replaced with engineered fill as described below. Engineered fill should also be used were site levels need to be raised.

The excavated silty clay and crushed sandstone may be re-used as engineered fill, provided deleterious materials and particle sizes greater than 60mm are excluded. The fill for backfilling earthworks platforms should be compacted in layers of not greater than 200mm loose thickness, to a minimum density of 98% of Standard Maximum Dry Density.

All compacted fill should either be retained or battered to a slope no steeper than 1 Vertical (V) in 2 Horizontal (H). All permanently exposed fill embankments should be protected from erosion by quickly establishing a grass cover or by structural means.

Density testing should be carried out at a frequency of at least one test per fill layer per 1000m² or three tests per layer per visit, whichever requires the most tests. At least Level 2 testing of earthworks should be carried out in accordance with AS3798. Preferably, the geotechnical testing authority should be engaged directly on behalf of the client and not as part of the earthworks contract.

The earthworks recommendations provided here should be complemented by reference to AS3798.

6.5.2 Pavement Design and Construction

The design of the proposed car park and driveway pavements over a soil subgrade will depend on subgrade preparation, the nature and composition of new fill imported to the site, as well as vehicle loadings and use. Based on the investigation results, we recommend that design of any new pavements be based on a soaked CBR value of 10.0% for the compacted residual silty clay subgrade prepared as outlined above. For concrete or rigid pavement design, a short term Young's Modulus of 75MPa should be adopted.

Concrete pavements overlying a soil subgrade should be supported on a sub-base layer of RTA3051 specification unbound or equivalent good quality crushed rock, compacted to a density of at least 100% SMDD. The sub-base material would provide more uniform slab support and would reduce 'pumping' of sub-grade 'fines' at joints.

Concrete pavements should be provided with effective shear connection at points by using dowels or keys. Concrete pavements or specially thickened asphaltic concrete should be used in areas where heavy vehicles manoeuvre such as garbage bin and truck unloading areas.

Subsoil drains should be provided on the uphill side of the development and along the perimeter of pavements, with inverts not less than 0.2m below clay subgrade level. The drainage trench should be excavated with a longitudinal fall to appropriate discharge points so as to reduce the risk of water ponding. The pavement subgrade should be graded to promote water flow or infiltration towards subsoil drains.

6.5.3 Earthquake Design Parameters

On the basis of the investigation results and in accordance with AS1170.4-2007, a Hazard Factor (Z) of 0.08 is applicable for the site, together with a subsoil Class Be for structures founded on, or in, rock and a subsoil Class Ce for structures founded in the soil profile.

6.5.4 Soil Aggression

Based on the investigation results, a 'non-aggressive' exposure classification is applicable to piles in soil in accordance with AS2159-2009.

7 Further Geotechnical Input

Below is a summary of the previously recommended additional work that needs to be carried out:

- Additional Geotechnical Investigation to confirm the depth and quality of Unit 4 sandstone/shale bedrock or better across the site.
- Installation of at least two monitoring wells.
- Stability assessment of temporary batters using computer modelling software such as WALLAP.
- Impact assessment of proposed excavation on RMS asset using computer modelling software PLAXIS.
- Preparation of a Monitoring Plan for RMS.
- Installation of inclinometers and carry out monitoring during excavation works.
- Dilapidation surveys.
- Design of working platforms (if required) for construction plant by an experienced and qualified geotechnical engineer.
- Vibration monitoring during rock excavation.
- Classification of all excavated material transported off site.
- Witnessing installation and proof-testing of anchors (if required).
- Geotechnical inspections of foundations; and
- Ongoing monitoring of groundwater inflows into the bulk excavation.

We recommend that a meeting be held after initial structural design has been completed to confirm that our recommendations have been correctly interpreted. We also recommend a meeting at the commencement of construction to discuss the primary geotechnical issues and inspection requirements.

8 Limitations

This report has been prepared for use by the Client who has commissioned the works in accordance with the project brief only and has been based on information provided by the Client. The advice herein relates only to this project and all results, conclusions and recommendations made should be reviewed by a competent and experienced person with experience in geotechnical investigations, before being used for any other purpose.

ADE Consulting Group Pty Ltd (ADE) accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced or amended in any way without prior approval by the client or ADE and should not be relied upon by any other party, who should make their own independent enquiries.

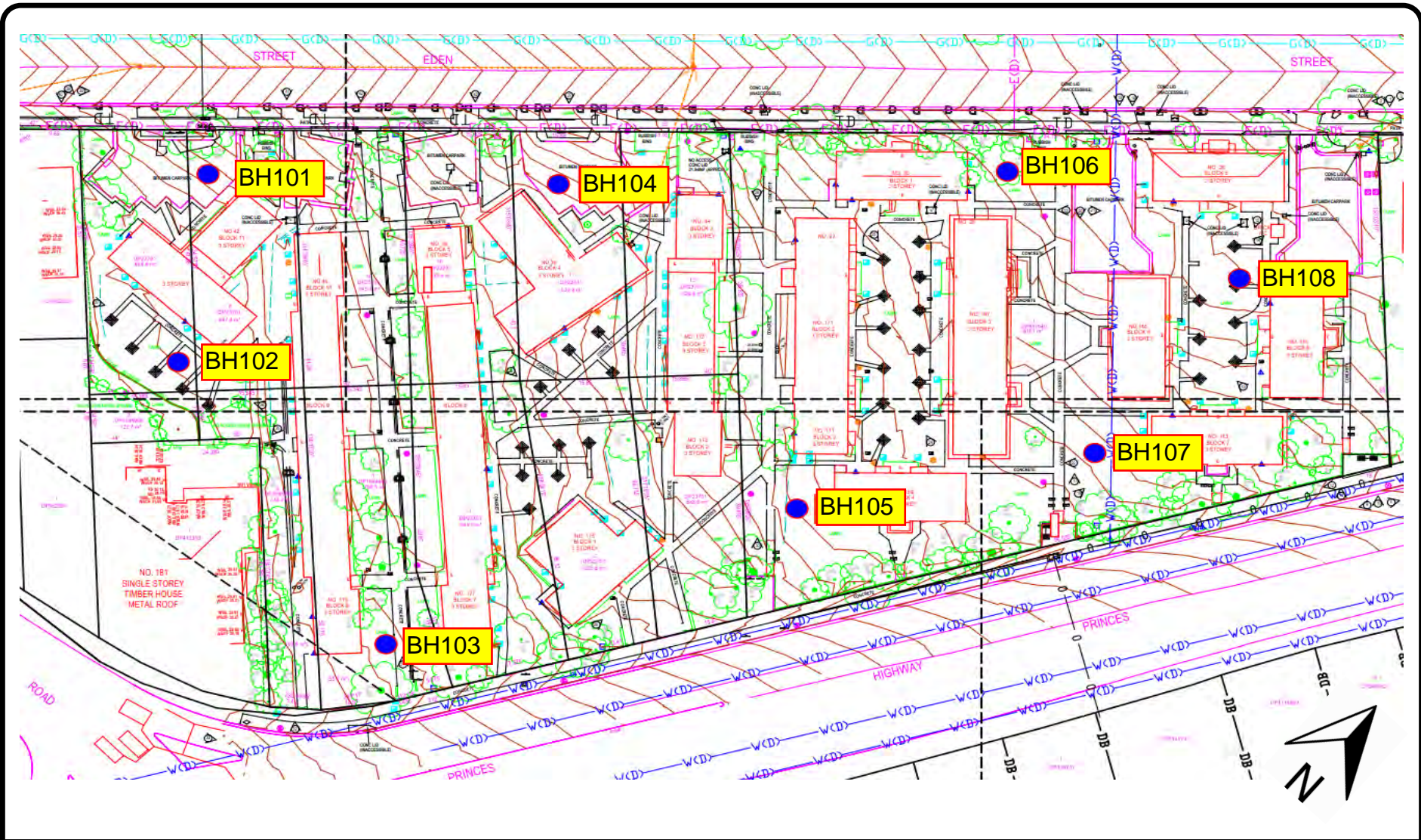
This report does not provide a complete assessment of the geotechnical status of the site and it is limited to the scope defined herein. Should information become available regarding conditions at the site (e.g., conditions exposed at the site during earthworks varying significantly with the results within this report), ADE reserves the right to review the report in the context of the additional information.

ADE's professional opinions are based upon its professional judgement, experience, training and results from analytical data. In some cases, further testing and analysis may be required, thus producing different results and/or opinions. ADE has limited investigation to the scope agreed upon with its client.

This report has been written with the intent of providing information of the site subsurface to the client for design and construction purposes. Subsurface conditions relevant to the works undertaken by the client should be assessed by a competent contractor who can make their own interpretation of the data represented within this report.

Subsurface conditions will always vary within a worksite and the extremes of these variations cannot be defined by exhaustive investigations, and as such, the measurements and values obtained within this result may not be representative of these extremes.

Appendix I – Borehole Location Plan



TITLE:	Borehole Location Plan	JOB #:	STC-2148-18709	PREPARED:	OV
PROJECT:	Arncliffe Site - Geotechnical Investigation	VERSION:	1	CHECKED:	JP
CLIENT:	Billbergia Pty Ltd	PAGE:	1 of 1	DATE:	21.12.2020

Appendix II – Borehole Logs and Core Photos

NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 101

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

FILE / JOB NO : STC-2148-18709
 SHEET : 1 OF 4

POSITION : E: 328748.7, N: 6243121.6 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 26.00 (m AHD) ANGLE FROM HORIZONTAL : 90°
 EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN
 DATE STARTED : 24/11/2020 DATE COMPLETED : 24/11/2020 DATE LOGGED : 24/11/2020 LOGGED BY : NH CHECKED BY : JP

DRILLING				MATERIAL												
DRILLING & CASING	WATER	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	PENETROMETER TEST				STRUCTURE & Other Observations
												5	10	15	20	
AD/T			B-1			[Cross-hatched pattern]		0.02m 0.15m								FILL
			0.40m 0.50m B-1			[Diagonal hatching]		0.50m								RESIDUAL SOIL
			1100m SPT 6,8,9 N=17	25.0	1.0				M	H						PP: >600, >600, >600 kPa
			1.45m					1.76m								
				24.0	2.0			Continued as Cored Drill Hole								
				23.0	3.0											
				22.0	4.0											
				21.0	5.0											
				20.0	6.0											
				19.0	7.0											

TYPE C BOREHOLE DATABASE.GLB Log ADE NON-CORED LOG BILLBERGIA-STC-2148-18709.GPJ <-DrawingFile>> 21/12/2020 10:58 10.02.0004 D:\git\Lab and In Situ Tool - DGD | Lib: ADE 1.00.0.2018.08.01 Pj: ADE 1.00.0.2018.08.01

See Explanatory Notes for details of abbreviations & basis of descriptions.



CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 101
 FILE / JOB NO : STC-2148-18709
 SHEET : 2 OF 4

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328748.7, N: 6243121.6 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 26.00 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED: 24/11/2020 DATE COMPLETED : 24/11/2020 LOGGED BY : NH CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES					
DRILLING & CASING	WATER	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral L -0.1 M -0.3 H -1 VH -3 EH -10	NATURAL FRACTURE (mm)	ROD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other	
												20	40	100	300	1000
			25.0	1.0								
						1.76m START CORING AT 1.76m						
			24.0	2.0		SANDSTONE , fine to coarse grained, red and brown, yellow and pale grey, extremely weathered, extremely low to soil strength	XW				0	2.00: Ewz
						2.40m 2.45m CORE LOSS 0.05m CORE LOSS						
			23.0	3.0		SANDSTONE , fine to medium grained, pale grey, and pale orange, extremely weathered, extremely low to soil strength, with grey laminations, indistinctly cross bedded at 0-20°, closely to moderately spaced	MW				0	2.65: Ewz
		1 Is(50) a=0.4 MPa					SW					
			22.0	4.0		4.20m-5.20m: Trace coarse grained sandstone bands					95	4.98: Cs, 0-5°, 20mm 5.02: Be, 0-10°, Ir, Ro, IS 5.08: Be, 10-20°, Pl, Ro, IS
		1 Is(50) a=1.18 MPa										
			21.0	5.0								5.58: Cs, 10°, 2mm, clay
			20.0	6.0			SW - FR					
		1 Is(50) a=0.96 MPa										
			19.0	7.0		7.30-7.52m: shale lens					92	7.41: shale lense, Ew to Hw weathered
		1 Is(50) a=0.68 MPa										
		1 Is(50) a=0.75 MPa										

TYPE C BOREHOLE DATABASE.GLB Log ADE CORED BOREHOLE LOG BILLBERGIA-STC-2148-18709.GPJ <<DrawingFile>> 21/12/2020 10:59 10/02/2004 D:\git\Lab and In Situ\Tool - DGD | Lib: ADE 100.0.2018-08-01 Proj: ADE 100.0.2018-08-01

See Explanatory Notes for details of abbreviations & basis of descriptions.



CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 101
 FILE / JOB NO : STC-2148-18709
 SHEET : 3 OF 4

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328748.7, N: 6243121.6 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 26.00 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED: 24/11/2020 DATE COMPLETED : 24/11/2020 LOGGED BY : NH CHECKED BY : JP

DRILLING				MATERIAL				FRACTURES			
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral	NATURAL FRACTURE (mm)	ROD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
DRILLING & CASING	WATER										
NMLC						SW FR					
		1 Is(50) a=1.05 MPa	17.0	9.0	●	●	●	●	92		8.22: Cs, 0-5°, 130mm, sandy clay
		1 Is(50) a=1.16 MPa	16.0	10.0	●	●	●	●	98		10.60: Cs, 0-5°, 20mm, sandy clay
		1 Is(50) a=1.7 MPa	15.0	11.0	●	●	●	●			
		1 Is(50) a=1.86 MPa	14.0	12.0	●	●	●	●			
		1 Is(50) a=0.67 MPa	13.0	13.0	●	●	●	●	97		12.26: Fz, 5-10°, 60mm 12.88: Be, 0-5°, Ir, Ro, IS
		1 Is(50) a=0.58 MPa	12.0	14.0	●	●	●	●			14.32: Cs, 0-5°, 20mm 14.53: Ewz, 0-5°, 30mm
		1 Is(50) a=0.58 MPa	11.0	15.0	●	●	●	●	96		14.88: Cs, 0-5°, 20mm

See Explanatory Notes for details of abbreviations & basis of descriptions.



TYPE C BOREHOLE DATABASE.GLB Log ADE CORED BOREHOLE LOG BILLBERGIA-STC-2148-18709.GPJ <-DrawingFile>> 21/12/2020 10:59 10.02.00.04 D:\geol\lab\and\in\Site\Tech\ DGD | Lib: ADE 100.0.2018.08.01 Proj: ADE 100.0.2018.08.01

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 101

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

FILE / JOB NO : STC-2148-18709
 SHEET : 4 OF 4

POSITION : E: 328748.7, N: 6243121.6 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 26.00 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED: 24/11/2020 DATE COMPLETED : 24/11/2020 LOGGED BY : NH CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES					
DRILLING & CASING	WATER	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral	NATURAL FRACTURE (mm)	ROD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other	
												VI L M H VH EH	20 40 100 300 1000
NMLC					<p>SANDSTONE, fine to medium grained, pale grey, and pale orange, extremely weathered, extremely low to soil strength, with grey laminations, indistinctly cross bedded at 0-20°, closely to moderately spaced (<i>continued</i>)</p>	SW FR	●	|	98	—	16.83: Cc, 0-5°, 10mm
		1 Is(50) a=1.11 MPa	9.0	7.0	●			|	—		18.30: Jt, 70°, Pl, Ro, Cl	
		1 Is(50) a=1.27 MPa	8.0	8.0	●			|	—		19.60: Cs, 5-10°, 10mm, sandy clay	
		1 Is(50) a=1.21 MPa	7.0	9.0	●			|	—		20.28: Ewz, 0-5°, 20mm, sandy clay	
		1 Is(50) a=1.27 MPa	6.0	20.0	●			|	—		20.48: Be, 0°, Pl, Sm, Is	
		1 Is(50) a=2.19 MPa	5.0	24.0	●		—	21.00: E.C.R				
					Hole Terminated at 21.00 m Target depth						
				4.0	22.0							
				3.0	23.0							

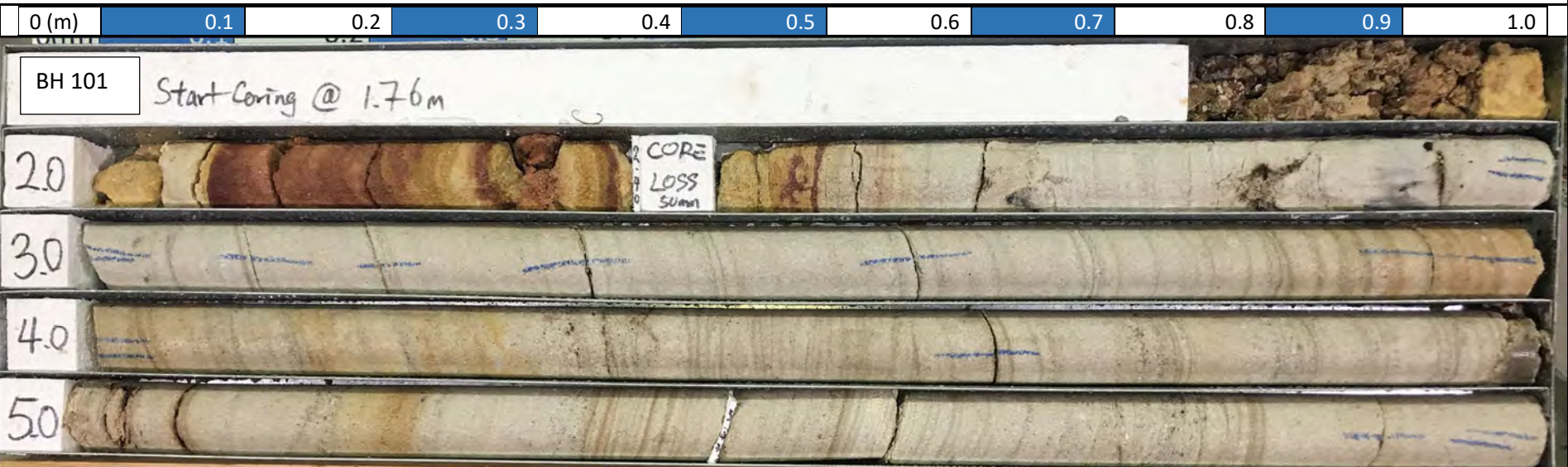
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See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE Consulting Group

Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 1.76 m – 6.0 m
 Core Photo : No. 1




	Client:	Billbergia Pty Ltd	Borehole No:	BH 101
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	1.76 m – 6.0 m
	Title:	Core Photographs	Photograph By:	NH
	Location:	31 Eden St. Arncliffe, NSW	Date:	23.11.2020

ADE Consulting Group

Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 6.0 m – 11.0 m
 Core Photo : No. 2

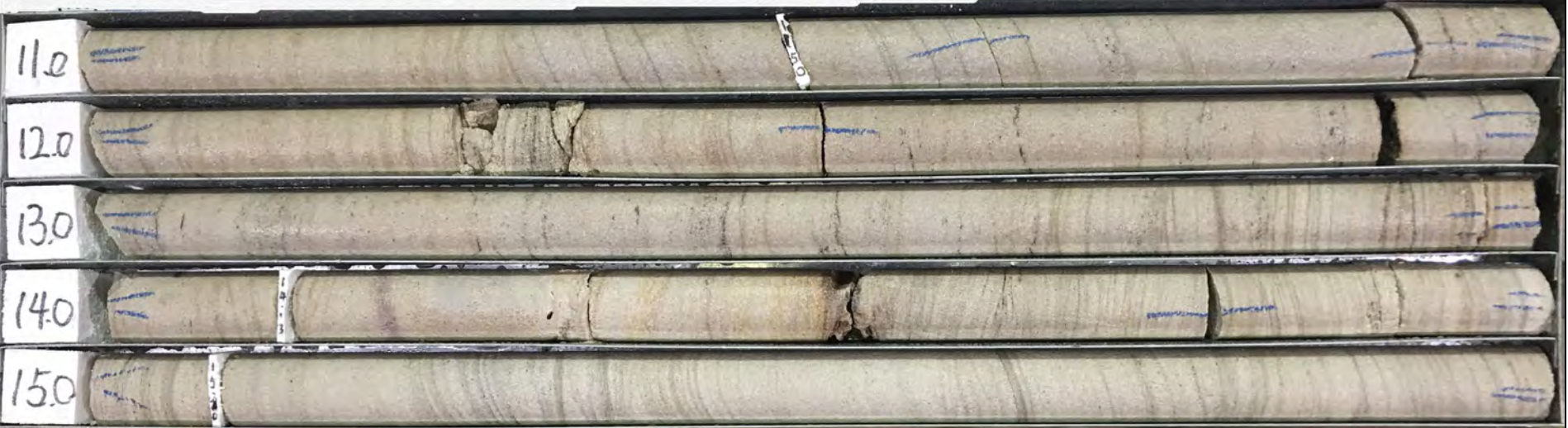
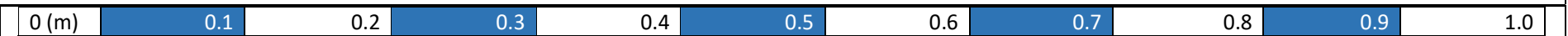
0 (m)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
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	Client:	Billbergia Pty Ltd	Borehole No:	BH 101
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	6.0 m – 11.0 m
	Title:	Core Photographs	Photograph By:	NH
	Location:	31 Eden St. Arncliffe, NSW	Date:	23.11.2020

ADE Consulting Group

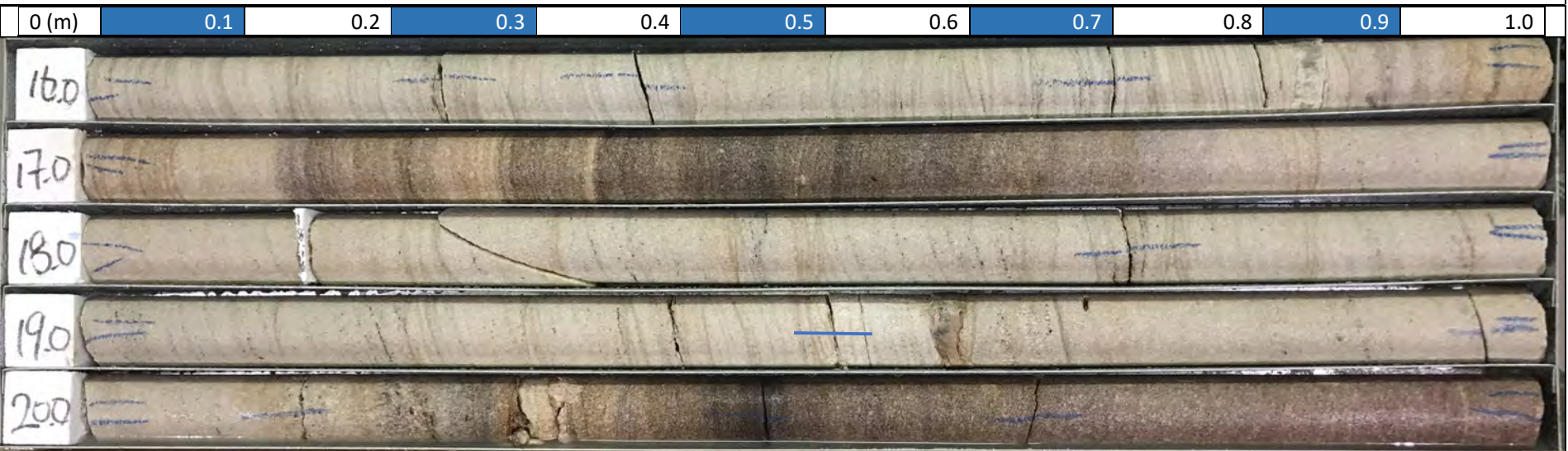
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 11.0 m – 16.0 m
 Core Photo : No. 3




	Client:	Billbergia Pty Ltd	Borehole No:	BH 101
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	11.0 m – 16.0 m
	Title:	Core Photographs	Photograph By:	NH
	Location:	31 Eden St. Arncliffe, NSW	Date:	23.11.2020

ADE Consulting Group

Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 16.0 m – 21.0 m
Core Photo : No. 4



	Client:	Billbergia Pty Ltd	Borehole No:	BH 101
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	16.0 m – 21.0 m
	Title:	Core Photographs	Photograph By:	NH
	Location:	31 Eden St. Arncliffe, NSW	Date:	23.11.2020

NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 102
 FILE / JOB NO : STC-2148-18709
 SHEET : 1 OF 4

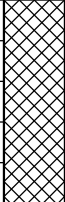
CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328776.2, N: 6243092.2 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 27.03 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED : 23/11/2020 DATE COMPLETED : 23/11/2020 DATE LOGGED : 23/11/2020 LOGGED BY : DK CHECKED BY : JP

DRILLING					MATERIAL											
PROGRESS		GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	PENETROMETER TEST				STRUCTURE & Other Observations
DRILLING & CASING	WATER											5	10	15	20	
↑ AD/T ↓				27.0	1.0		1.00m	FILL: Silty SAND, fine to medium grained sand, brown, fine to medium gravel, trace of tree rootlets and organic material	M			-	-	-	-	FILL
				26.0	1.0			Continued as Cored Drill Hole				-	-	-	-	
				25.0	2.0							-	-	-	-	
				24.0	3.0							-	-	-	-	
				23.0	4.0							-	-	-	-	
				22.0	5.0							-	-	-	-	
				21.0	6.0							-	-	-	-	
				20.0	7.0							-	-	-	-	

TYPE C BOREHOLE DATABASE.GLB Log ADE NON-CORED LOG BILLBERGIA-STC-2148-18709.GPJ <-DrawingFiles> 21/12/2020 10:48 10.02.0004 D:\git\Lab and In Situ Tool - DGD | Lab ADE 1.00.0.2018.08.01 Pj ADE 1.00.0.2018.08.01

See Explanatory Notes for details of abbreviations & basis of descriptions.



CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 102

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

FILE / JOB NO : STC-2148-18709
 SHEET : 2 OF 4

POSITION : E: 328776.2, N: 6243092.2 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 27.03 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED: 23/11/2020 DATE COMPLETED : 23/11/2020 LOGGED BY : DK CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES					
DRILLING & CASING	WATER	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral L -0.1 M -0.3 H -1 VH -3 EH -10	NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other	
			27.0									
				1.00m		1.00m START CORING AT 1.00m						
		1 Is(50) a=0.15 MPa	26.0	1.0		SANDSTONE, fine to medium grained, pale grey to orange, with indistinct laminations at 0-20°	SW			92	1.37: Ewz, 0-5°, 10mm, sandy caly	
		1 Is(50) a=0.17 MPa	25.0	2.0							2.70: Be, 0-5°, Pl, Ro, Is	
		1 Is(50) a=0.32 MPa	24.0	3.0							2.95: Cs, 0-5°, 30mm, sandy clay	
			23.0	4.0		3.89m 4.00m CORE LOSS 0.11m					3.44: Ewz, 0-5°, 50mm, sandy clay 3.72: Cs, 5°, 10mm, sandy clay, Is 3.84: EWZ, 0-5°, 80mm, Sandy Clay	
		1 Is(50) a=0.54 MPa	22.0	5.0		SANDSTONE, fine to medium grained, pale grey to orange, with indistinct laminations at 0-20°	FR			97	4.29: Be, 10-30°, Pl, Ro, Is	
		1 Is(50) a=0.69 MPa	21.0	6.0							5.68: Ewz, 0-5°, 10mm, Sandy Clay 5.93: Cs, 0-5°, 20mm, sandy clay	
		1 Is(50) a=1.1 MPa	20.0	7.0						100	6.66: Ewz, 5-30°, 20-40mm, sandy clay	

TYPE C BOREHOLE DATABASE.GLB Log ADE CORED BOREHOLE LOG BILLBERGIA-STC-2148-18709.GPJ <<DrawingFile>> 21/12/2020 10:48 10/02/00.04 D:\geol\lab\and\in\Site\Tool - DGD | Lib: ADE 100.0\2018-08-01 Proj: ADE 100.0\2018-08-01

See Explanatory Notes for details of abbreviations & basis of descriptions.



CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 102
 FILE / JOB NO : STC-2148-18709
 SHEET : 3 OF 4

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328776.2, N: 6243092.2 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 27.03 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED: 23/11/2020 DATE COMPLETED : 23/11/2020 LOGGED BY : DK CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES				
DRILLING & CASING	WATER	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● - Axial ○ - Diametral	NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
		1 Is(50) a=1.38 MPa	19.0		.....	SANDSTONE, fine to medium grained, pale grey to orange, with indistinct laminations at 0-20° (continued)	FR	●	|	100	
		1 Is(50) a=1.78 MPa	18.0	9.0	.....			●	|	90	9.17: Jt, 80-90°, Pl, Ro, Ve
		1 UCS 8.33 MPa	17.0	0.0	.....			●	|	90	9.76: Jt, 60-70°, Pl, Ro, Ve 9.96: Be, 0-10°, Pl, Ro, Is
		1 Is(50) a=2.02 MPa	16.0	1.0	.....			●	|	90	10.22: Be, 10-20°, Pl, Ro, Co, sandy clay 10.41: Be, 15-20°, Pl, Ro, Is
			15.0	2.0	.....			●	|	98	11.84: Cs, 5-20°, 30mm, sandy Clay
		1 Is(50) a=2.02 MPa	14.0	3.0	.....			●	|	98	
		1 Is(50) a=2.3 MPa	13.0	4.0	.....			●	|	96	
		1 Is(50) a=1.35 MPa	12.0	5.0	.....			●	|	96	14.97: Ewz, 5-20°, 50mm, sandy clay
		1 Is(50) a=1.07 MPa			.....			●	|	96	15.60: Ewz, 0-5°, 10mm, Sandy Clay

TYPE C BOREHOLE DATABASE.GLB Log ADE CORED BOREHOLE LOG BILLBERGIA-STC-2148-18709.GPJ <-DrawingFile>> 21/12/2020 10:48 10/02/2004 D:\geot\Lab\and\In Situ\Tech - DGD\Lab\ADE 100.0.2018-08-01 Proj\ADE 100.0.2018-08-01

See Explanatory Notes for details of abbreviations & basis of descriptions.

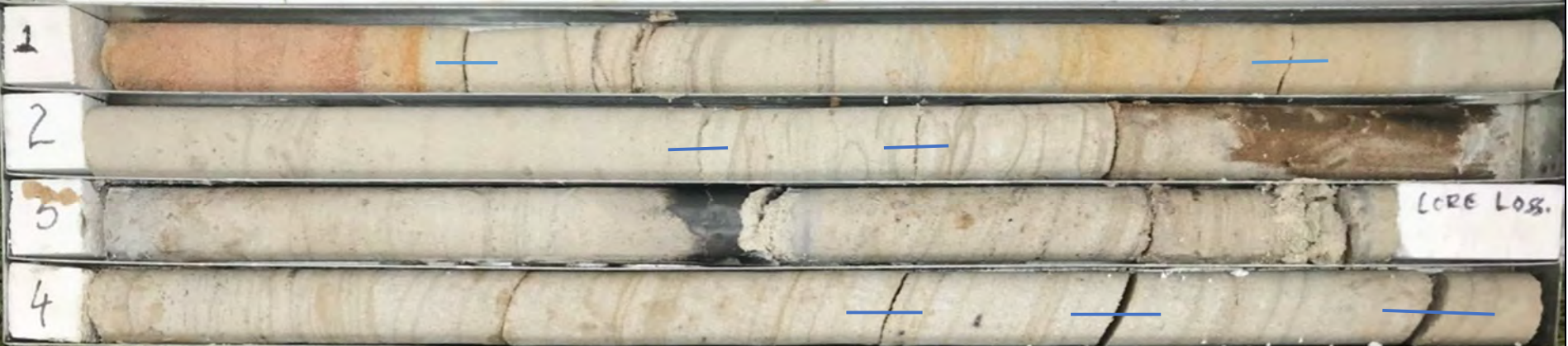



ADE Consulting Group

Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 1.00 m – 5.00 m
 Core Photo : No. 1

0 (m)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
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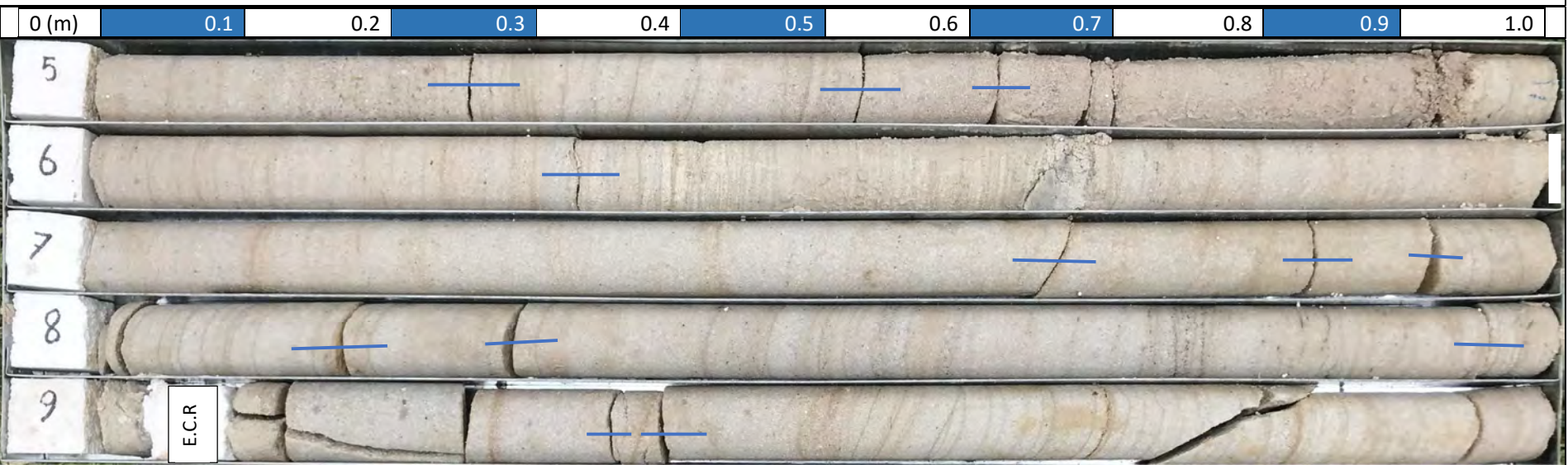
STC-2148-18709 Start Coring BH102 @ 1.00m




 ADECONSULTINGGROUP <small>SOLUTIONS THROUGH INNOVATION</small>	Client:	Billbergia Pty Ltd	Borehole No:	BH 102
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	1.0 m – 5.0 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	24.11.2020

ADE Consulting Group

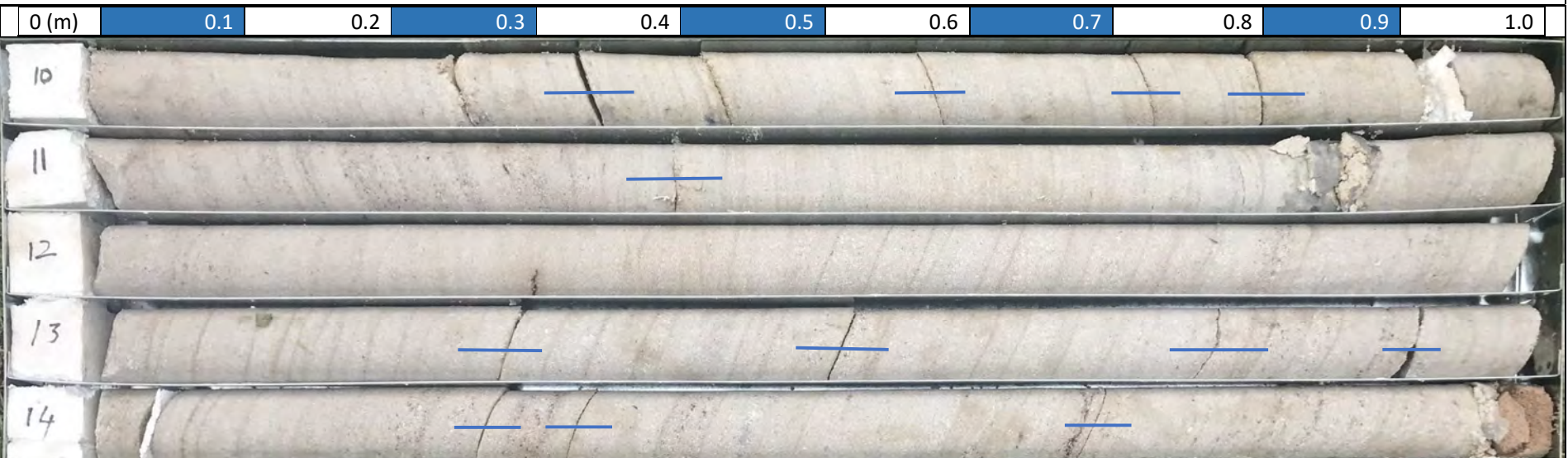
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 5.00 m – 10.0 m
 Core Photo : No. 2




	Client:	Billbergia Pty Ltd	Borehole No:	BH 102
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	5.0 m – 10.0 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	24.11.2020

ADE Consulting Group

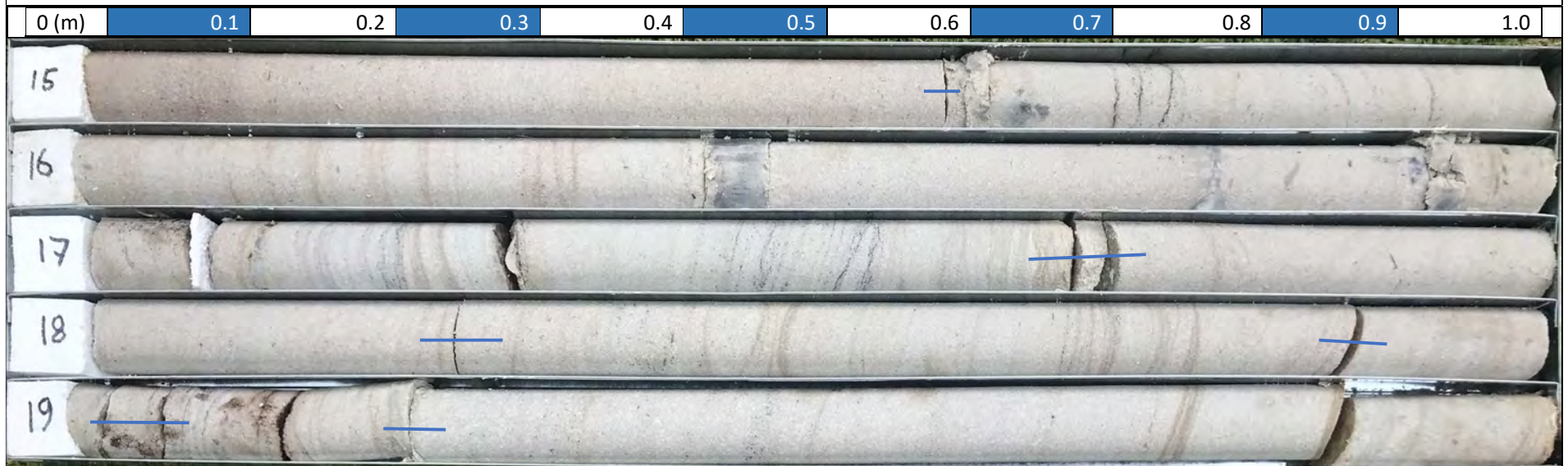
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 10.0 m – 15.0 m
 Core Photo : No. 3




	Client:	Billbergia Pty Ltd	Borehole No:	BH 102
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	10.0 m – 15.0 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	24.11.2020

ADE Consulting Group

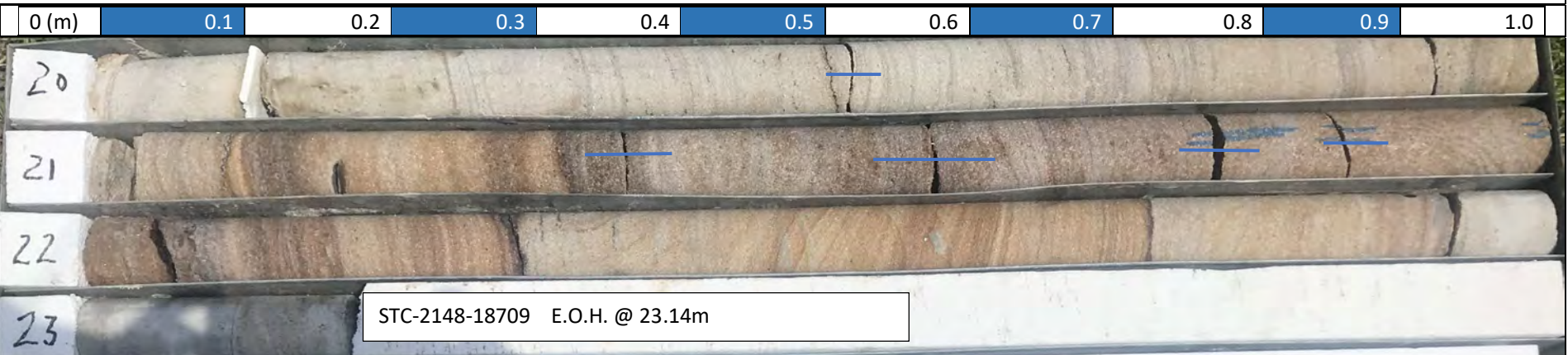
Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 15.0 m – 20.0m
Core Photo : No. 4




	Client:	Billbergia Pty Ltd	Borehole No:	BH 102
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	15.0 m – 20.0 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	24.11.2020

ADE Consulting Group

Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 20.0 m – 23.14 m
 Core Photo : No. 5



	Client:	Billbergia Pty Ltd	Borehole No:	BH 102
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	20.0 m – 23.14 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	24.11.2020

NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 103
 FILE / JOB NO : STC-2148-18709
 SHEET : 1 OF 5

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328821.5, N: 6243084.4 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 26.85 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED : 23/11/2020 DATE COMPLETED : 23/11/2020 DATE LOGGED : 23/11/2020 LOGGED BY : NH CHECKED BY : JP

DRILLING				MATERIAL												
DRILLING & CASING	WATER	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	PENETROMETER TEST				STRUCTURE & Other Observations
												5	10	15	20	
AD/T			Not Encountered			0.10m		Top Soil FILL: Silty SAND, fine grained, dark brown, trace of tree rootlets	D						FILL	
			0.50m B-1	26.0	1.0	1.00m 1.00m		1.04m							RESIDUAL SOIL	
			SPT 23,R,R N=R			1.45m	CL-CI	Sandy CLAY , low to medium high plasticity, pale grey and brown, fine to medium grained sand, with fine to medium grained sandstone gravel	w < PL	H						
				25.0	2.0			Continued as Cored Drill Hole								
				24.0	3.0											
				23.0	4.0											
				22.0	5.0											
				21.0	6.0											
				20.0	7.0											
				19.0												

TYPE C BOREHOLE DATABASE.GLB Log ADE NON-CORED LOG BILLBERGIA-STC-2148-18709.GPJ <-DrawingFiles> 21/12/2020 10:37 10:02:00:04 D:\git\Lab and In Situ Tool - DGD | Lib\ ADE 1.00.0.2018.08.01 Pj\ ADE 1.00.0.2018.08.01

See Explanatory Notes for details of abbreviations & basis of descriptions.



CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 103

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

FILE / JOB NO : STC-2148-18709
 SHEET : 2 OF 5

POSITION : E: 328821.5, N: 6243084.4 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 26.85 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED: 23/11/2020 DATE COMPLETED : 23/11/2020 LOGGED BY : NH CHECKED BY : JP

DRILLING			MATERIAL					FRACTURES			
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● - Axial ○ - Diametral	NATURAL FRACTURE (mm)	ROD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
DRILLING & CASING	WATER										
↑ NMLC											
			26.0	1.0							
						1.58m START CORING AT 1.58m					
		1 Is(50) a=0.2 MPa	25.0	2.0		<p>SANDSTONE, fine to medium grained, pale grey with light brown and yellow laminations, cross-bedded at 0-20°, with discontinuous iron bands</p> <p>MW - SW</p>	●		95	2.09: Be, 20°, Pl, Ro, Is	
		1 Is(50) a=0.39 MPa	24.0	3.0			●		95	3.72: Jt, 70°, Pl, Ro, Ve	3.85: Jt, 45°, Pl, Ro, Cl
		1 Is(50) a=0.46 MPa	23.0	4.0			●		95	4.45: Be, 0°, Pl, Ro, Is	
	Not Encountered		22.0	5.0			●		95		
		1 Is(50) a=0.36 MPa					●		95		
		1 Is(50) a=0.36 MPa					●		95		
			21.0	6.0			●		94	5.64: Sz, 160mm	
		1 Is(50) a=0.79 MPa	20.0	7.0			●		94		7.14: Cs, 0-5°, 20mm, clay
		1 Is(50) a=0.94 MPa	19.0				●		98		
							7.82-8.16m: purple band				

See Explanatory Notes for details of abbreviations & basis of descriptions.

TYPE C BOREHOLE DATABASE.GLB Log ADE CORED BOREHOLE LOG BILLBERGIA-STC-2148-18709.GPJ <-DrawingFile> 21/12/2020 10:38 10/02/2004 D:\geol\lab\and\in\Site\Tools\DCD\Lab\ADE 100.0.2018-08-01 Proj\ADE 100.0.2018-08-01

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 103
 FILE / JOB NO : STC-2148-18709
 SHEET : 3 OF 5

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328821.5, N: 6243084.4 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 26.85 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED: 23/11/2020 DATE COMPLETED : 23/11/2020 LOGGED BY : NH CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES				
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral VI -0.1 L -0.3 M -1 H -3 VH -5 EH -10	NATURAL FRACTURE (mm)	ROD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
DRILLING & CASING	WATER										
NMLC											
Not Encountered											
		1 Is(50) a=1 MPa	18.0	9.0	•••••	SANDSTONE , fine to medium grained, pale grey with light brown and yellow laminations, cross-bedded at 0-20°, with discontinuous iron bands (<i>continued</i>)	●	|	98		9.00: Cs, 0-5°, 10mm, sandy clay
		1 Is(50) a=1.66 MPa	17.0	10.0	•••••		●	|	98		10.20: Be, 0-10°, Pl, Ro, Co
		1 Is(50) a=1.1 MPa	16.0	11.0	•••••	10.35-10.75m: carbonaceous speckles	●	|	97		10.78: Be, 0-5°, Pl, Ro, Co, sandy clay
		1 Is(50) a=1.24 MPa	15.0	12.0	•••••		●	|	97		12.30: Cs, 0-20°, 50mm, sandy clay
		1 Is(50) a=1.41 MPa	14.0	13.0	•••••	●	|	98		12.55: Be, 15-20°, Pl, Ro, Co	
		1 Is(50) a=1.37 MPa	13.0	14.0	•••••	●	|	98		12.78: Be, 0°, Pl, Ro, Co, sandy clay	
		1 Is(50) a=1.28 MPa	12.0	15.0	•••••	●	|	98		13.19: Ewz, 0°-20°, 2-10mm, sandy clay	
		1 Is(50) a=1.29 MPa	11.0		•••••	●	|	98		15.48: Cs, 0-10°, 20mm, clay	

TYPE C BOREHOLE DATABASE.GLB Log ADE CORED BOREHOLE LOG BILLBERGIA-STC-2148-18709.GPJ <<DrawingFile>> 21/12/2020 10:38 10/02/2020 10:38 10/02/2020 10:38 10/02/2020 10:38 10/02/2020 10:38 10/02/2020 10:38 10/02/2020 10:38 10/02/2020 10:38 10/02/2020 10:38

See Explanatory Notes for details of abbreviations & basis of descriptions.

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 103
 FILE / JOB NO : STC-2148-18709
 SHEET : 4 OF 5

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328821.5, N: 6243084.4 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 26.85 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED: 23/11/2020 DATE COMPLETED : 23/11/2020 LOGGED BY : NH CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES				
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral	NATURAL FRACTURE (mm)	ROD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
DRILLING & CASING	WATER										
NMLC Not Encountered											
		1 Is(50) a=1.26 MPa	10.0	17.0	●	SANDSTONE, fine to medium grained, pale grey with light brown and yellow laminations, cross-bedded at 0-20°, with discontinuous iron bands (<i>continued</i>)	MW • SW	●		98	
		1 Is(50) a=1.04 MPa		9.0	●	16.58-17.20m: becoming purple and brown		●		97	17.33: 2x Ewz, 0-10°, 10-20mm, spaced at 50mm 17.82: Jt, 0-40°, Pl, Ro, Co, sandy clay
		1 Is(50) a=0.42 MPa		8.0	●			●		100	
		1 Is(50) a=0.53 MPa		7.0	●			●		95	20.27: 2x Cs, 0-5°, 5-10mm, sandy clay, spaced at 50 mm
		1 Is(50) a=0.65 MPa		6.0	●	21.20-23.28m: becoming purple and brown		●		95	21.56: 2x Be, 0°, Pl, Sm, Is, spaced at 30 mm
		1 Is(50) a=1.83 MPa		5.0	●			●		100	
		1 Is(50) a=2.27 MPa		4.0	●			●		100	22.80: Jt, 20°, Pl, Ro, Is 23.27: Be, 5°, Pl, Ro, Is
		1 Is(50) a=1.63 MPa		3.0	●			●		100	23.69: Be, 0°, Pl, Sm, Is

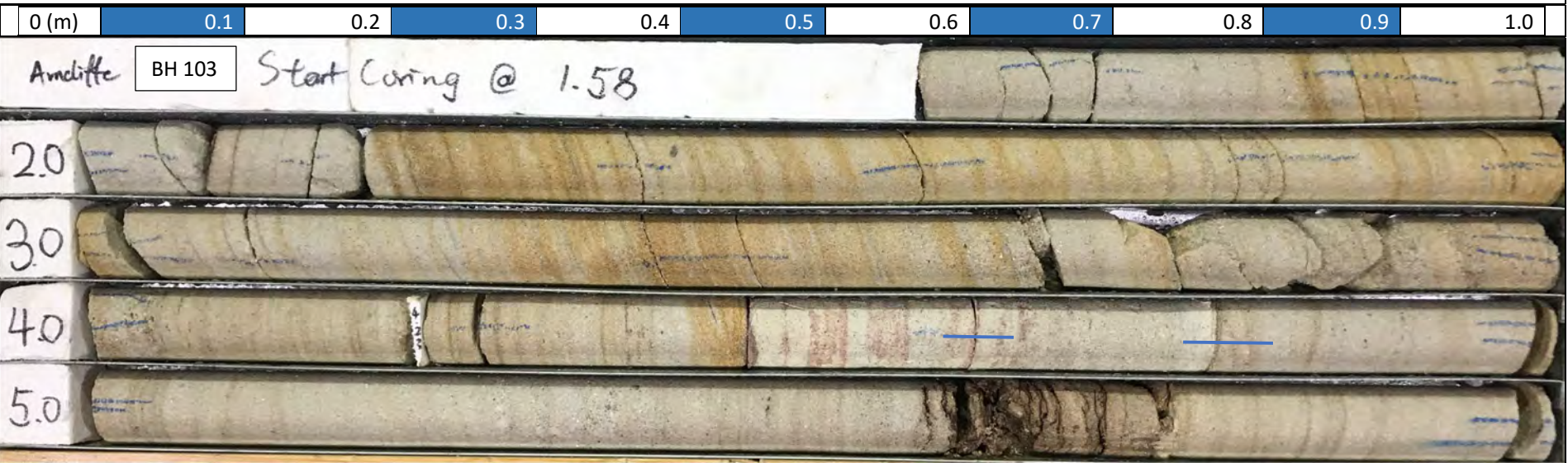
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See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE Consulting Group

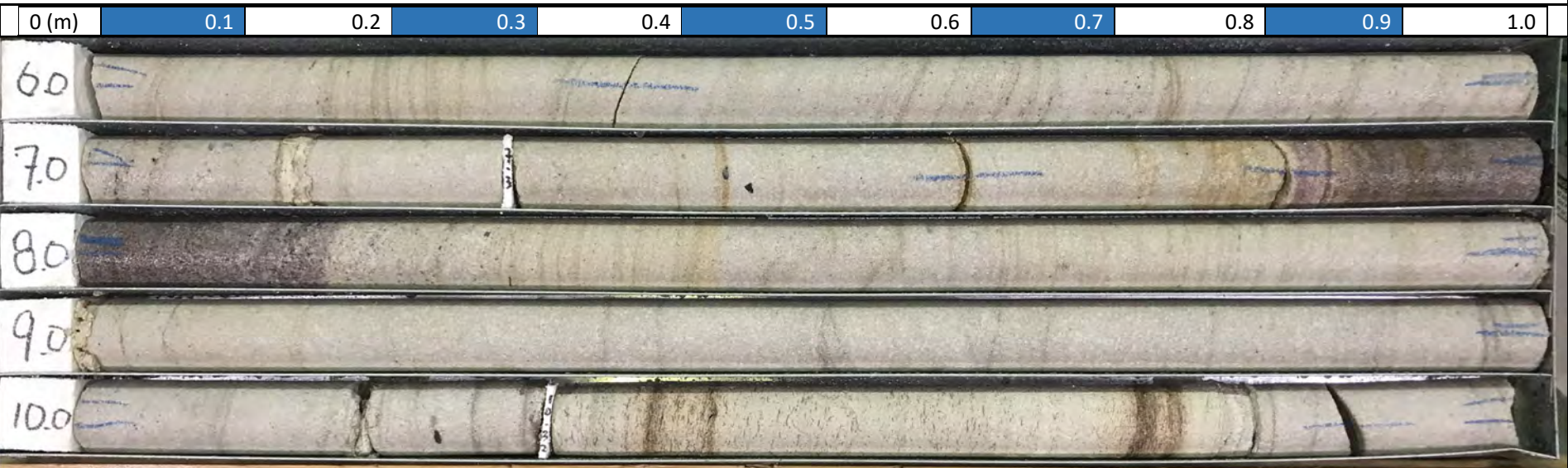
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 1.58 m – 6.00 m
 Core Photo : No. 1




	Client:	Billbergia Pty Ltd	Borehole No:	BH 103
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	1.58 m – 6.0 m
	Title:	Core Photographs	Photograph By:	NH
	Location:	31 Eden St. Arncliffe, NSW	Date:	23.11.2020

ADE Consulting Group

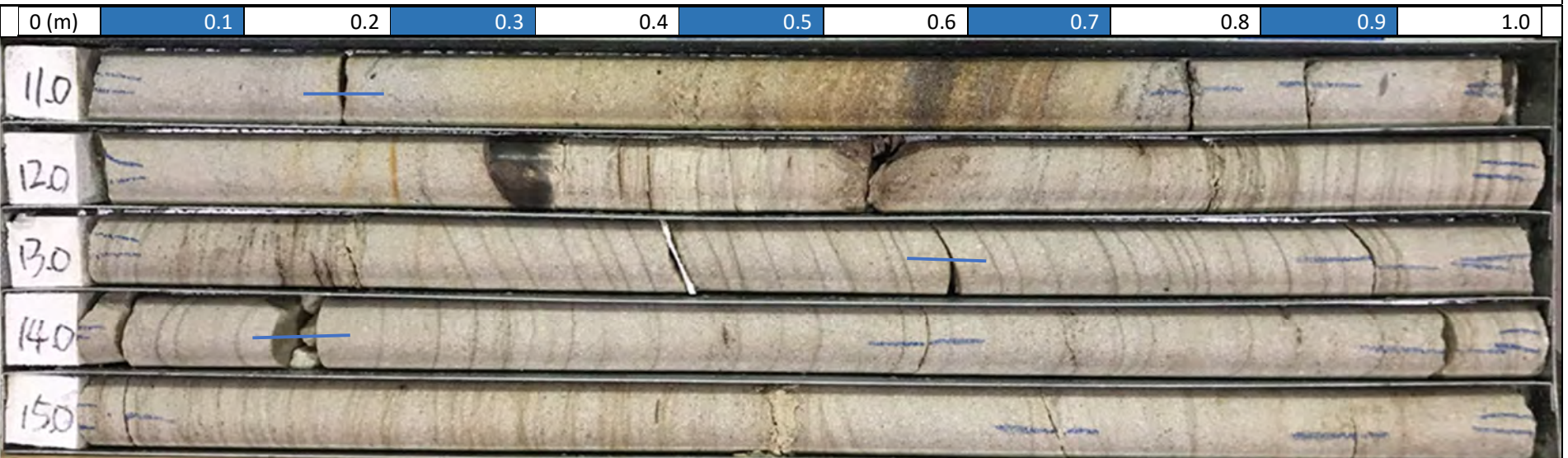
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 6.0 m – 11.0 m
 Core Photo : No. 2




	Client:	Billbergia Pty Ltd	Borehole No:	BH 103
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	6.0 m – 11.0 m
	Title:	Core Photographs	Photograph By:	NH
	Location:	31 Eden St. Arncliffe, NSW	Date:	23.11.2020

ADE Consulting Group

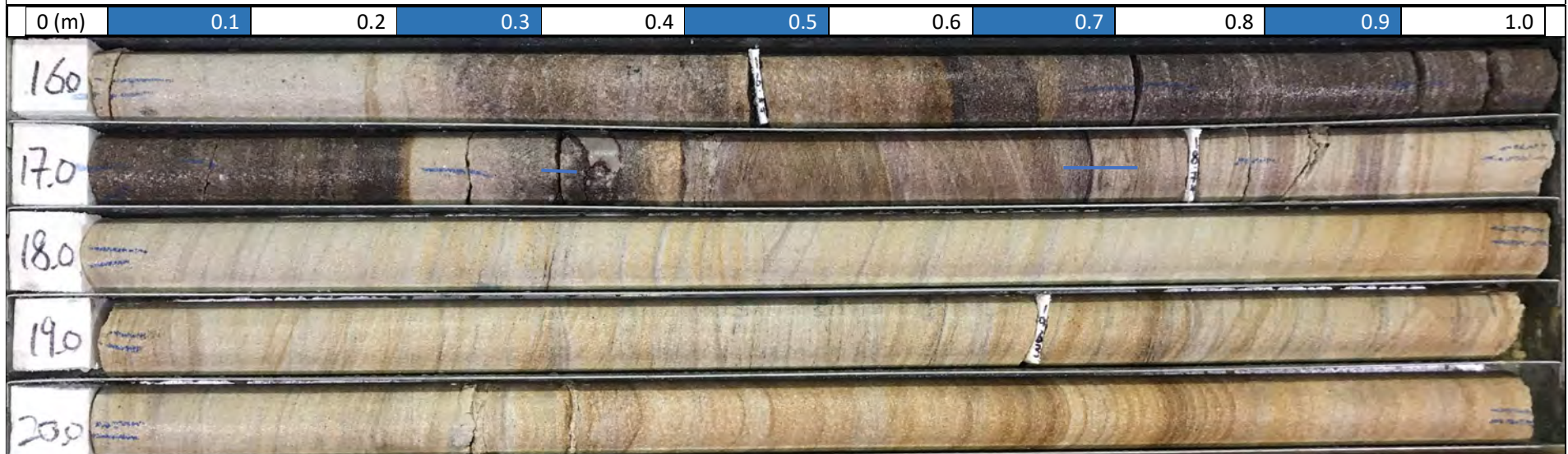
Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 11.0 m – 16.0 m
Core Photo : No. 3




	Client:	Billbergia Pty Ltd	Borehole No:	BH 103
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	11.0 m – 16.0 m
	Title:	Core Photographs	Photograph By:	NH
	Location:	31 Eden St. Arncliffe, NSW	Date:	23.11.2020

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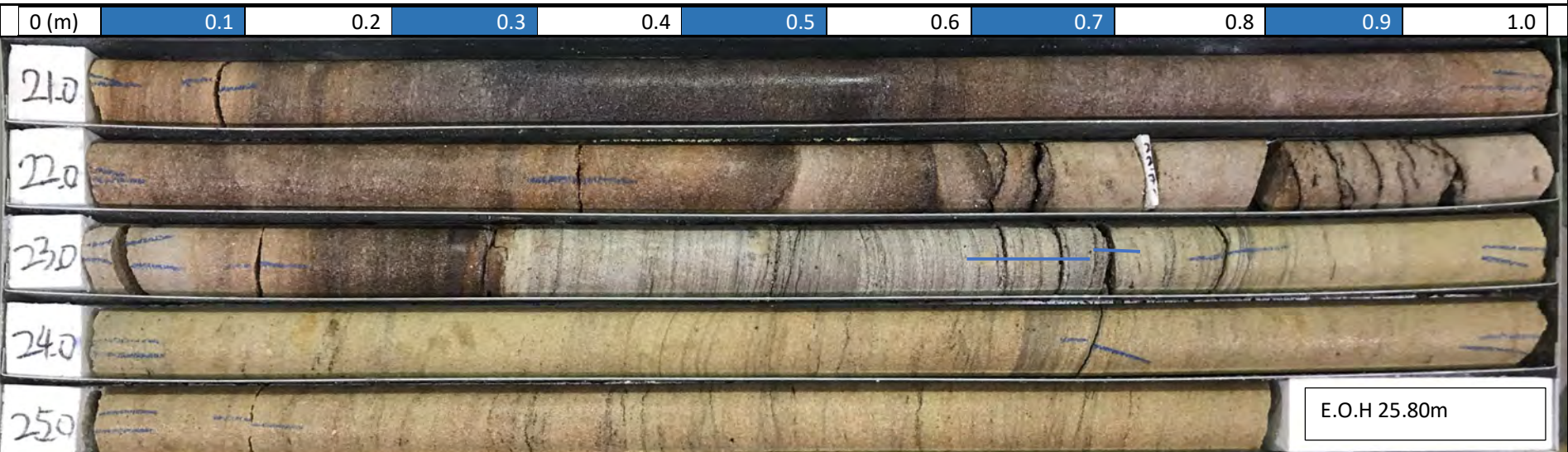
Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 16.0 m – 21.0m
Core Photo : No. 4




	Client:	Billbergia Pty Ltd	Borehole No:	BH 103
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	16.0 m – 21.0 m
	Title:	Core Photographs	Photograph By:	NH
	Location:	31 Eden St. Arncliffe, NSW	Date:	23.11.2020

ADE Consulting Group

Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 21.0 m – 25.82 m
 Core Photo : No. 5



	Client:	Billbergia Pty Ltd	Borehole No:	BH 103
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	21.0 m – 25.82 m
	Title:	Core Photographs	Photograph By:	NH
	Location:	31 Eden St. Arncliffe, NSW	Date:	23.11.2020

NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 104
 FILE / JOB NO : STC-2148-18709
 SHEET : 1 OF 4

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328872.6, N: 6243171.3 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 23.30 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED : 28/11/2020 DATE COMPLETED : 28/11/2020 DATE LOGGED : 28/11/2020 LOGGED BY : DK CHECKED BY : JP

DRILLING					MATERIAL											
DRILLING & CASING	WATER	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	PENETROMETER TEST				STRUCTURE & Other Observations
												5	10	15	20	
ADIT		Not Encountered	1.00m SPT 2,3,2 N=5 1.45m	23.0	23.0	[Cross-hatched pattern]		FILL: Silty SAND, fine to medium grained, dark brown, with fine to medium sandstone gravel, with organic material @0.5m: becoming red-brown	M						FILL	
				22.0	22.0	[Diagonal hatching]	CI-CH	Sandy CLAY, medium to high plasticity, red and brown, fine to coarse grained sand, with fine to medium angular to subangular gravel	M	F - St					RESIDUAL SOIL PP: 90, 180 kPa	
				21.0	21.0	[Diagonal hatching]		Continued as Cored Drill Hole								
				20.0	20.0											
				19.0	19.0											
				18.0	18.0											
				17.0	17.0											
				16.0	16.0											

TYPE C BOREHOLE DATABASE.GLB Log ADE NON-CORED LOG BILLBERGIA-STC-2148-18709.GPJ <-DrawingFiles> 21/12/2020 10:15 10:02:00:04 D:\git\Lab and In Situ Tool - DGD | Lab ADE 1.00.0.2018.08.01 Pj: ADE 1.00.0.2018.08.01

See Explanatory Notes for details of abbreviations & basis of descriptions.



CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 104

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

FILE / JOB NO : STC-2148-18709
 SHEET : 2 OF 4

POSITION : E: 328872.6, N: 6243171.3 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 23.30 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED: 28/11/2020 DATE COMPLETED : 28/11/2020 LOGGED BY : DK CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES				
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● - Axial ○ - Diametral	NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
DRILLING & CASING	WATER										
			23.0								
			22.0								
			21.0								
			20.0			2.50m START CORING AT 2.50m					
		1 Is(50) d=0.06 a=0.06 MPa	3.0			SANDSTONE, fine to medium grained, brown, extremely weathered, very low estimated strength, iron indurated	XW			0	2.70: Ewz, 400mm 3.00: Ewz, 15mm
		1 Is(50) d=0.09 a=0.05 MPa	20.0			SANDSTONE, fine to medium grained, brown and pale grey, and red, indistinctly cross-bedded at 0-20°, iron indurated	HW				3.83: Be, 0-5°, Pl, Ro, Co, sandy clay
		1 Is(50) d=0.15 a=0.13 MPa	19.0			4.50m				98	
		1 Is(50) d=0.08 a=0.07 MPa	18.0				MW				5.73: Jt, 60°, Pl, Ro, Ve 5.95: Be, 30°, Pl, Ro, Ve 6.05: Be, 0-5°, Pl, Ro, Co, clayey sand 6.28: Be, 0-10°, Pl, Ro, Co, clayey sand
		1 Is(50) d=0.34 a=0.2 MPa	17.0			6.28-6.80m: becoming orange and grey					
		1 Is(50) d=0.19 a=0.14 MPa	16.0				SW			96	6.98: Ewz, 30mm, sandy clayey 7.20: 2x Be, 0-5°, St, Ro, Is, spaced at 30 mm

TYPE C BOREHOLE DATABASE.GLB Log ADE CORED BOREHOLE LOG BILLBERGIA-STC-2148-18709.GPJ <-DrawingFile>> 21/12/2020 12:47 10:02:00.04 D:\git\Lab and In Situ Tools - DGD | Lib: ADE 100.0\2018-08-01 Proj: ADE 100.0\2018-08-01

See Explanatory Notes for details of abbreviations & basis of descriptions.



CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 104

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

FILE / JOB NO : STC-2148-18709
 SHEET : 4 OF 4

POSITION : E: 328872.6, N: 6243171.3 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 23.30 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED: 28/11/2020 DATE COMPLETED : 28/11/2020 LOGGED BY : DK CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES				
DRILLING & CASING	WATER	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral	NATURAL FRACTURE (mm)	ROD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
NMLC	Not Encountered	1 Is(50) d=1.68 a=2.03 MPa	7.0		.....	SANDSTONE, fine to medium grained, pale grey, with grey laminations, indistinctly cross-bedded at 0-10° <i>(continued)</i> 16.28-17.40: becoming orange, red-brown	FR SW	●	|	100	16.35: Ewz, 10°, Un, Ro, Is, 10 mm
		1 Is(50) d=1.43 a=2.17 MPa	6.0		.....			●	|	100	
			17.87m		.....	Hole Terminated at 17.87 m Target depth					17.87: E.C.R
			18.0		.....					
			5.0		.....					
			19.0		.....					
			4.0		.....					
			20.0		.....					
			3.0		.....					
			21.0		.....					
			2.0		.....					
			22.0		.....					
			1.0		.....					
			23.0		.....					
			0.0		.....					

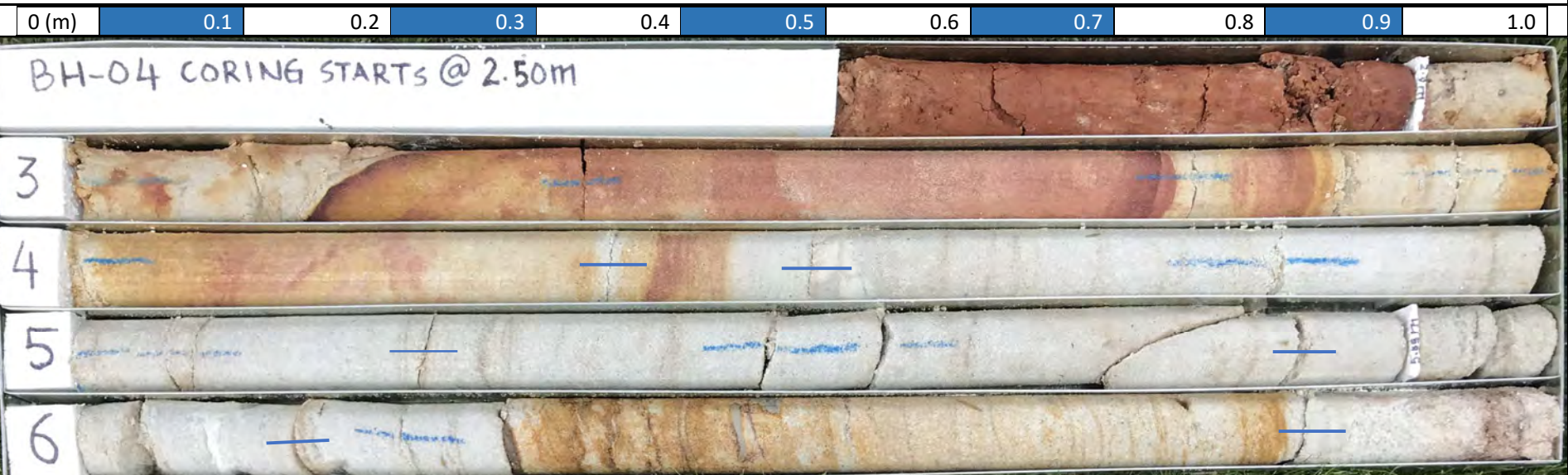
TYPE C BOREHOLE DATABASE.GLB Log ADE CORED BOREHOLE LOG BILLBERGIA-STC-2148-18709.GPJ <<DrawingFile>> 21/12/2020 12:47 10.02.00.04 D:\git\Lab\and\In Situ\Tool - DGD | Lib: ADE 100.0.2018-08-01 Proj: ADE 100.0.2018-08-01


See Explanatory Notes for details of abbreviations & basis of descriptions.



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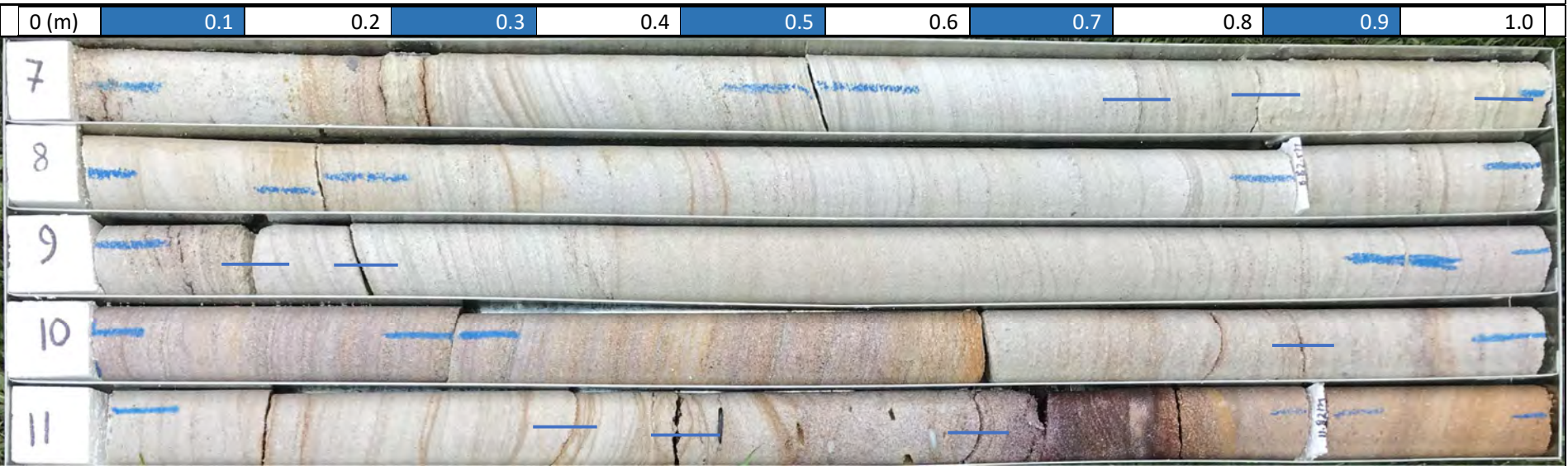
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 2.50 m – 7.0 m
 Core Photo : No. 1




	Client:	Billbergia Pty Ltd	Borehole No:	BH104
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	2.50 m – 7.0 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	28.11.2020

ADE Consulting Group

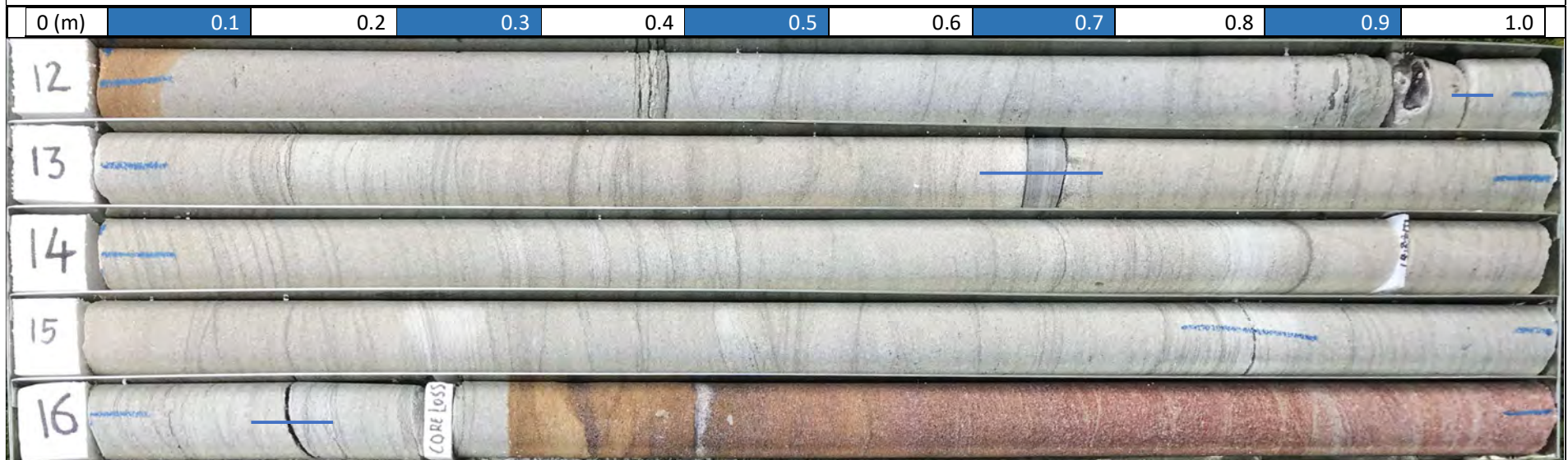
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 7.0 m – 12.0 m
 Core Photo : No. 2




	Client:	Billbergia Pty Ltd	Borehole No:	BH104
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	7.0 m – 12.0 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	28.11.2020

ADE Consulting Group

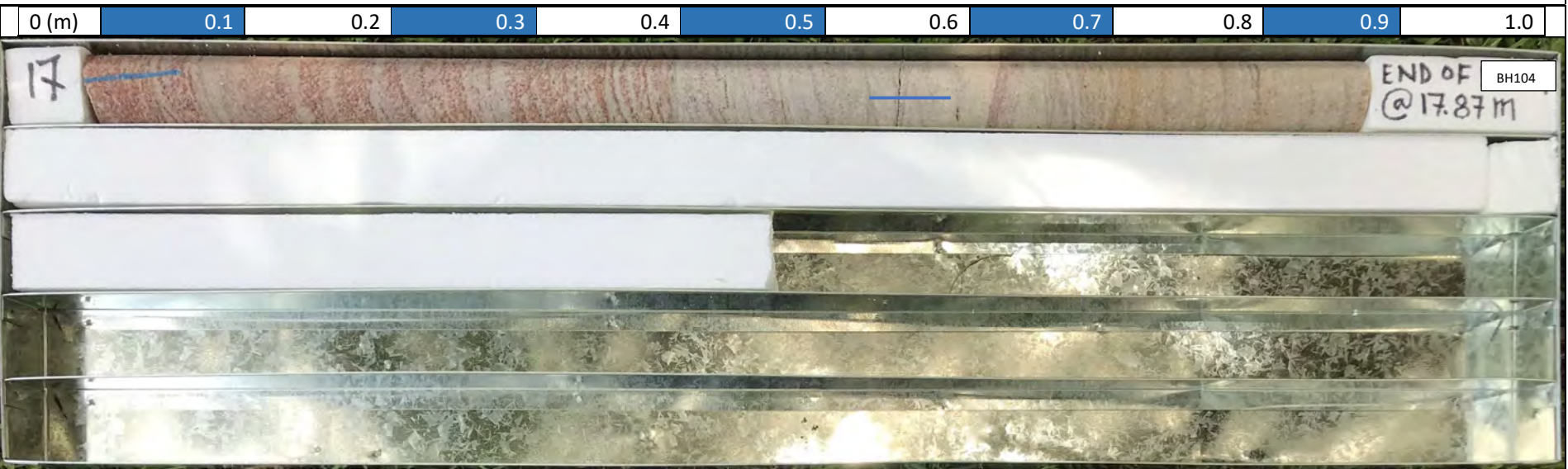
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 12.0 m – 17.0 m
 Core Photo : No. 3




 ADECONSULTINGGROUP <small>SOLUTIONS THROUGH INNOVATION</small>	Client:	Billbergia Pty Ltd	Borehole No:	BH104
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	12.0 m – 17.0 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	28.11.2020

ADE Consulting Group

Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 17.0 m – 17.87 m
 Core Photo : No. 4



	Client:	Billbergia Pty Ltd	Borehole No:	BH104
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	17.0 m – 17.87 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	28.11.2020

NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 105

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

FILE / JOB NO : STC-2148-18709
 SHEET : 1 OF 4

POSITION : E: 328846.9, N: 6243141.2 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 23.00 (m AHD) ANGLE FROM HORIZONTAL : 90°
 EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN
 DATE STARTED : 26/11/2020 DATE COMPLETED : 26/11/2020 DATE LOGGED : 26/11/2020 LOGGED BY : DK CHECKED BY : JP

DRILLING					MATERIAL											
DRILLING & CASING	WATER	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	PENETROMETER TEST				STRUCTURE & Other Observations
												5	10	15	20	
ADIT		Not Encountered	0.40m B-1	22.0	1.0	[Cross-hatched pattern]		0.50m FILL: Sandy CLAY , low to medium plasticity, red and grey, fine to medium grained sand, trace of organic material and root fibres	M						FILL	
						[Diagonal lines pattern]	CI	1.16m Sandy CLAY , medium plasticity, grey mottled red, fine to medium grained sand	w < PL VSt - H					RESIDUAL SOIL		
			1.00m SPT 25/130mm N=8					1.16m Continued as Cored Drill Hole								
				21.0	2.0											
				20.0	3.0											
				19.0	4.0											
				18.0	5.0											
				17.0	6.0											
				16.0	7.0											

TYPE C BOREHOLE DATABASE.GLB Log ADE NON-CORED LOG BILLBERGIA-STC-2148-18709.GPJ <-DrawingFile>> 21/12/2020 09:52 10:02:00:04 D:\git\Lab and In Situ Tool - DGD | Lib\ADE 1.00.0.2018.08.01 Pj\ADE 1.00.0.2018.08.01

See Explanatory Notes for details of abbreviations & basis of descriptions.



CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 105
 FILE / JOB NO : STC-2148-18709
 SHEET : 2 OF 4

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328846.9, N: 6243141.2 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 23.00 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED: 26/11/2020 DATE COMPLETED : 26/11/2020 LOGGED BY : DK CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES					
DRILLING & CASING	WATER	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral L -0.1 M -0.3 H -1 VH -3 VH -10 EH	NATURAL FRACTURE (mm)	ROD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other	
			22.0	1.0		1.16m START CORING AT 1.16m						
		Is(50) a=0.34 MPa				SANDSTONE, fine to medium grained, orange, pale grey and red, with occasional clay bands	HW MW					
			21.0	2.0			SW			98		1.71: Ewz, 0-5°, 30mm, sandy clay
		1 Is(50) a=0.68 MPa										
		1 Is(50) a=0.73 MPa										
			19.0	4.0								3.45: Be, 0-5°, Pl, Ro, Is
												3.93: Ewz, 0-10°, 10mm
		1 Is(50) a=0.4 MPa										4.20: Be, 20°, Pl, Sm, Is
			18.0	5.0						98		
		1 Is(50) a=0.24 MPa										5.88: Ewz, 0-5°, 5 mm, Pl, Ro, Ve
												6.06: Ewz, 0-5° 20mm
												6.25: Be, 30-40°, Pl, Ro, Is
		1 Is(50) a=0.4 MPa										6.50: Be, 0-5°, Pl, Ro, Cl
			16.0	7.0						98		7.49: Ewz, 0-20°, 20mm, sandy clay
		1 Is(50) a=0.59 MPa										7.92: Be, 0-5°, Pl, Ro, Ve

TYPE C BOREHOLE DATABASE.GLB Log ADE CORED BOREHOLE LOG BILLBERGIA-STC-2148-18709.GPJ <-DrawingFile>> 21/12/2020 09:56 10/02/2004 D:\geol\lab\and\in\Site\Tool - DGD | Lib: ADE 100.0.2018-08-01 Proj: ADE 100.0.2018-08-01

See Explanatory Notes for details of abbreviations & basis of descriptions.



CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 105
 FILE / JOB NO : STC-2148-18709
 SHEET : 3 OF 4

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328846.9, N: 6243141.2 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 23.00 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED: 26/11/2020 DATE COMPLETED : 26/11/2020 LOGGED BY : DK CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES						
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral	NATURAL FRACTURE (mm)	ROD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other		
DRILLING & CASING	WATER												
NMLC Not Encountered		1 Is(50) a=0.82 MPa	14.0	9.0	.....	SANDSTONE, fine to medium grained, orange, pale grey and red, with occasional clay bands (<i>continued</i>)	SW			98	8.22: Jt, 10°, Pl, Ro, Co, clayey sand		
											8.75: Ewz, 0-5°, 20mm, clayey sand		
											9.20: Ewz, 0-5°, 10mm, clayey sand		
		1 Is(50) a=2.24 MPa	13.0	10.0									10.56: Ewz, 0-5°, 20mm, sandy clay
		1 Is(50) a=0.12 MPa	12.0	11.0									10.85: Be, 0-5°, Pl, Ro, Is
													11.04: Be, 5°, Pl, Sm, Is
		1 Is(50) a=0.16 MPa	11.0	12.0									11.98: Be, 0-10°, Pl, Ro, Ve
					12.25: Be, 0-5°, Pl, Sm, Is								
					13.00: Be, 5°, Pl, Sm, Is								
1 Is(50) a=0.89 MPa	10.0	13.0				FR			100	14.08: Ewz, 5°, 5 mm			
1 Is(50) a=0.91 MPa	9.0	14.0											
1 Is(50) a=1.06 MPa	8.0	15.0											
												98	

TYPE C BOREHOLE DATABASE.GLB Log ADE CORED BOREHOLE LOG BILLBERGIA-STC-2148-18709.GPJ <-DrawingFile>> 21/12/2020 09:56 10:02:00.04 D:\git\Lab\and\In Situ\Tool - DGD | Lib: ADE 100.0.2018-08-01 Proj: ADE 100.0.2018-08-01

See Explanatory Notes for details of abbreviations & basis of descriptions.



CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 105

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

FILE / JOB NO : STC-2148-18709
 SHEET : 4 OF 4

POSITION : E: 328846.9, N: 6243141.2 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 23.00 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED: 26/11/2020 DATE COMPLETED : 26/11/2020 LOGGED BY : DK CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES				
DRILLING & CASING	WATER	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● - Axial ○ - Diametral L -0.1 M -0.3 H -1 VH -3 EH -10	NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
NMLC	Not Encountered	1 Is(50) a=1.03 MPa	6.0	7.0	.....	SANDSTONE, fine to medium grained, orange, pale grey and red, with occasional clay bands (continued)	FR	●	|	98	16.05: Jt, 50-60°, Pl, Ro, Cl
		1 Is(50) a=0.48 MPa	5.0	18.0	.....		SW	●	|		17.73: Be, 0-5°, Pl, Ro, Ve Jt, 80-90°, Pl, Ro, Is
						Hole Terminated at 18.07 m Target depth					18.07: E.C.R

TYPE C BOREHOLE DATABASE.GLB Log ADE CORED BOREHOLE LOG BILLBERGIA-STC-2148-18709.GPJ <<DrawingFile>> 21/12/2020 09:56 10:02:00.04 D:\get\Lab and In Situ\Tool - DGD | Lib: ADE 100.0\2018-08-01 Proj: ADE 100.0\2018-08-01

See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE Consulting Group

Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 1.16 m – 5.0 m
 Core Photo : No. 1

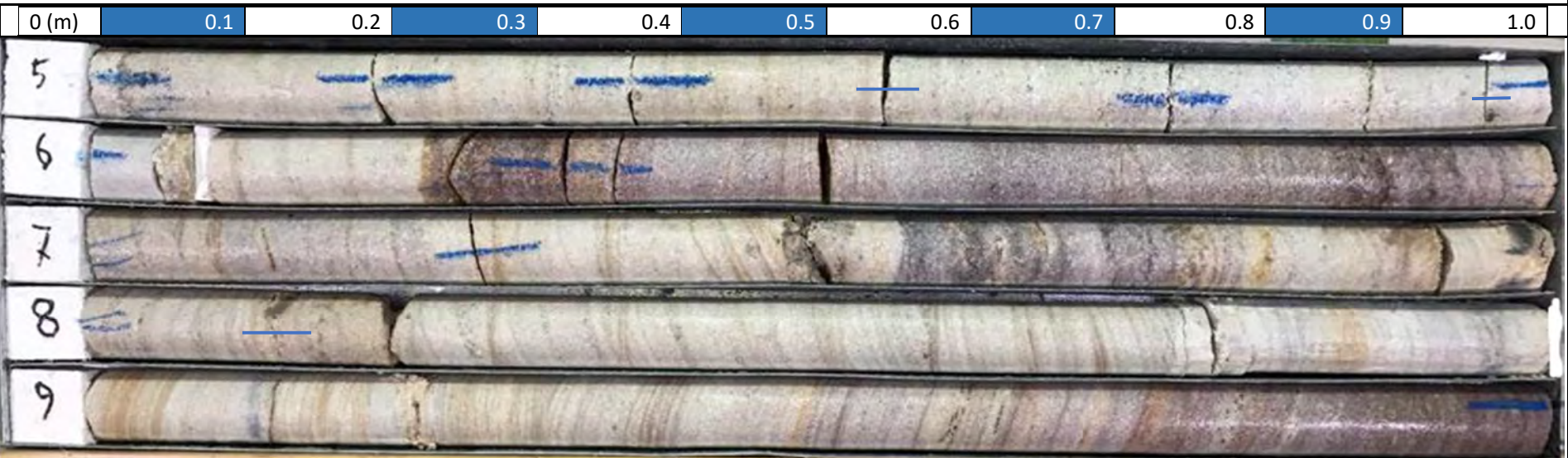
0 (m)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
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 ADECONSULTINGGROUP <small>SOLUTIONS THROUGH INNOVATION</small>	Client:	Billbergia Pty Ltd	Borehole No:	BH 105
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	1.16 m – 5.0 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	26.11.2020

ADE Consulting Group

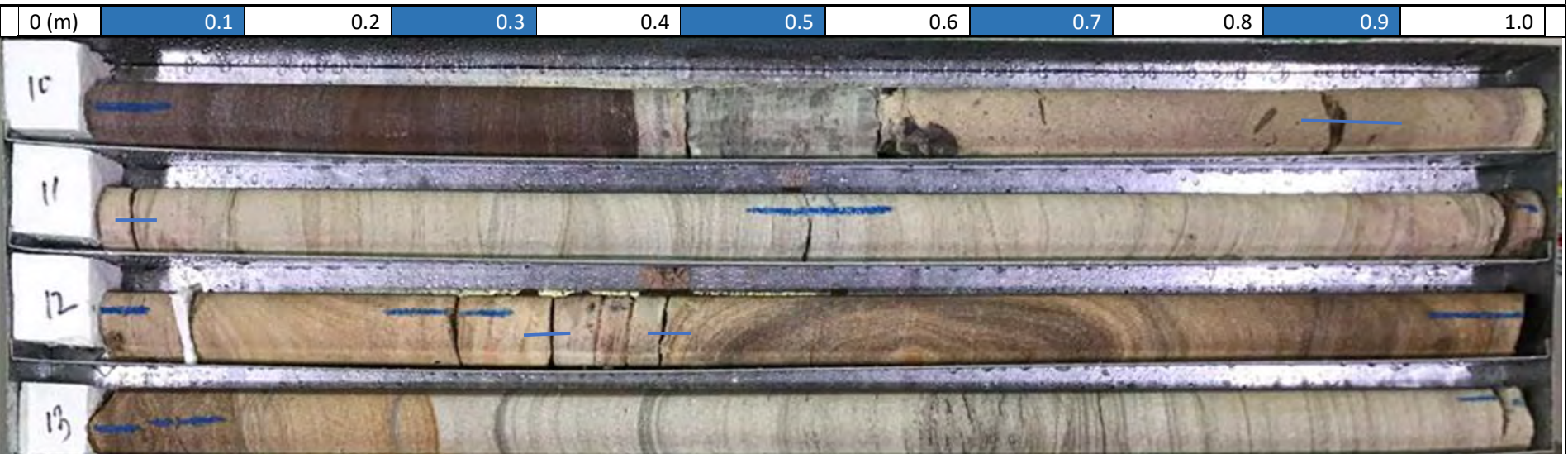
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 5.0 m – 10.0 m
 Core Photo : No. 2




	Client:	Billbergia Pty Ltd	Borehole No:	BH 105
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	5.0 m – 10.0 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	26.11.2020

ADE Consulting Group

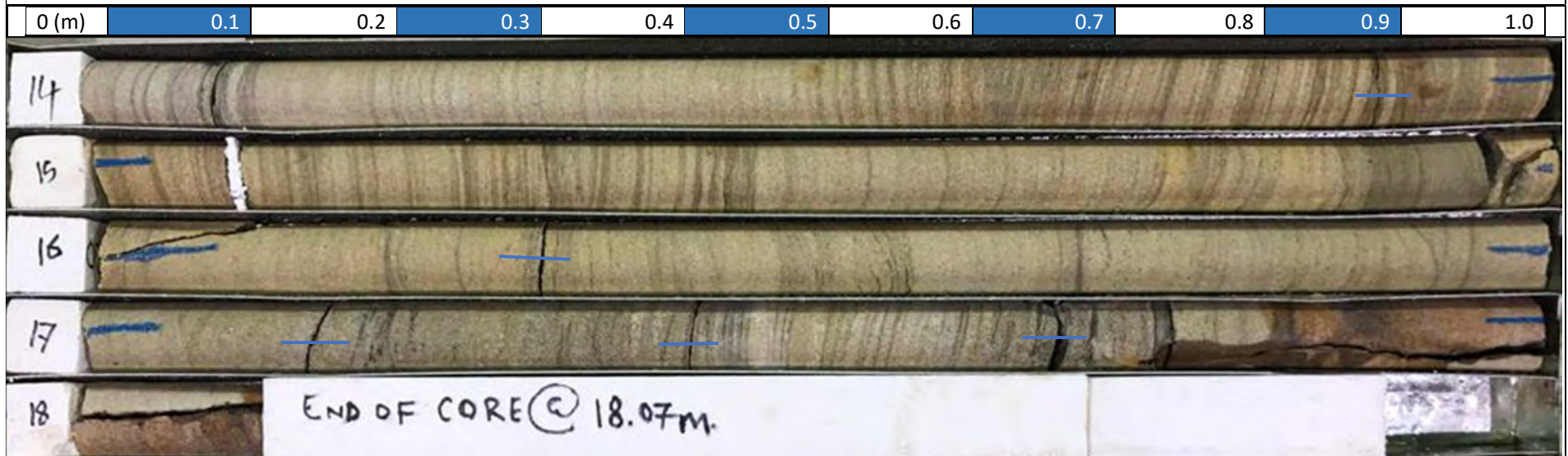
Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 10.0 m – 14.0 m
Core Photo : No. 3




	Client:	Billbergia Pty Ltd	Borehole No:	BH 105
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	10.0 m – 14.0 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	26.11.2020

ADE Consulting Group

Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 14.0 m – 18.07 m
Core Photo : No. 4



	Client:	Billbergia Pty Ltd	Borehole No:	BH 105
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	14.0 m – 18.07 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	26.11.2020

NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 106
 FILE / JOB NO : STC-2148-18709
 SHEET : 1 OF 4

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328833.1, N: 6243198.6 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 20.25 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED : 27/11/2020 DATE COMPLETED : 27/11/2020 DATE LOGGED : 27/11/2020 LOGGED BY : DK CHECKED BY : JP

DRILLING				MATERIAL												
DRILLING & CASING	WATER	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	PENETROMETER TEST				STRUCTURE & Other Observations
												5	10	15	20	
ADIT		Not Encountered	1.00m SPT 1,2,2 N=4	20.0	0.50m	[Cross-hatched pattern]		FILL: Silty SAND, fine to medium grained, dark brown, trace of sandstone gravel and tree rootlets	M						FILL	
				19.0	1.50m	[Diagonal lines pattern]	CI-CH	Sandy CLAY, medium to high plasticity, grey and brown, fine to medium grained sand		W	F				RESIDUAL SOIL	
				18.0	2.00m	[Dotted pattern]		SANDSTONE, fine to medium grained, pale grey and red-orange, extremely weathered, very low estimated strength								BEDROCK
				17.0	3.08m	[Dotted pattern]		2.00m: becoming grey Continued as Cored Drill Hole				H				

TYPE C BOREHOLE DATABASE.GLB Log ADE NON-CORED LOG BILLBERGIA-STC-2148-18709.GPJ <-DrawingFiles> 27/11/2020 11:08 10:02:00:04 D:\git\Lab and In Situ Tool - DGD | Lab ADE 1.00.0.2018-08-01 Pj: ADE 1.00.0.2018-08-01

See Explanatory Notes for details of abbreviations & basis of descriptions.



CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 106
 FILE / JOB NO : STC-2148-18709
 SHEET : 2 OF 4

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328833.1, N: 6243198.6 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 20.25 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED: 27/11/2020 DATE COMPLETED : 27/11/2020 LOGGED BY : DK CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES					
DRILLING & CASING	WATER	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral L -0.1 M -0.3 H -1 VH -3 VH -10 EH	NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other	
												20	40	100	300	1000
			20.0									
			19.0									
			18.0									
			3.0			3.08m START CORING AT 3.08m						
			17.0			SANDSTONE, fine to medium grained, pale grey, orange and brown, with grey and brown laminations, indistinctly cross-bedded at 0-10°, iron indurated	HW					3.16: Ewz, 0-5°, 20mm
		1 Is(50) d=0.3 a=0.17 MPa	4.0									
			16.0			4.45-4.52m: becoming red						3.75: Be, 0-40°, Ir, Ro, Co, clayey sand
		1 Is(50) d=0.04 a=0.1 MPa	5.0									4.14: Ewz, 0-5°, 30mm, clayey sand
			15.0									4.26: Be, 0-5°, Ir, Ro, Co., sandy clay
			14.0			6.30-7.40m: with coarse grained sandstone bands	MW					4.75: Ewz, 0-5°, 100mm
		1 Is(50) d=0.75 a=1.14 MPa	6.0									5.07: Ewz, 0-5°, 20mm
			13.0									5.48: Cs, 0°, 5 mm
		1 Is(50) d=1.9 a=1.87 MPa	7.0									5.62: Be, 0-10°, Pl, Ro, Co, sandy clay
												7.34: Ewz, 0-5°, 40mm, sandy clay
		1 Is(50) d=0.56 a=0.77 MPa										

TYPE C BOREHOLE DATABASE.GLB Log ADE CORED BOREHOLE LOG BILLBERGIA-STC-2148-18709.GPJ <<DrawingFile>> 21/12/2020 11:09 10:02:00.04 D:\git\Lab\and\In Situ\Tool - DGD | Lib: ADE 100.0.2018-08-01 Proj: ADE 100.0.2018-08-01

See Explanatory Notes for details of abbreviations & basis of descriptions.



CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 106
 FILE / JOB NO : STC-2148-18709
 SHEET : 3 OF 4

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328833.1, N: 6243198.6 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 20.25 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED: 27/11/2020 DATE COMPLETED : 27/11/2020 LOGGED BY : DK CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES				
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral L -0.1 L -0.3 M -1 H -3 VH -5 EH -10	NATURAL FRACTURE (mm)	ROD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
DRILLING & CASING	WATER										
		1 MPa Is(50) d=0.56 a=0.63 MPa	12.0			SANDSTONE, fine to medium grained, pale grey, orange and brown, with grey and brown laminations, indistinctly cross-bedded at 0-10°, iron indurated <i>(continued)</i>	MW			98	
		1 Is(50) d=0.84 a=1.91 MPa		11.0		10.00-12.25m: becoming pale orange and brown				100	9.60: Be, 0°, Pl, Sm, Is
		1 Is(50) d=1.31 a=1.18 MPa		11.0		11.10-11.15m: Shale lens					11.11: shale lens, 40mm
		1 Is(50) d=0.36 a=0.41 MPa		9.0							11.82: Be, 0-5°, Ir, Ro, Ve
	NMLC Not Encountered			8.0		12.25m					
		1 Is(50) d=1.03 a=0.97 MPa		8.0		SANDSTONE, fine to medium grained, grey with dark grey laminations, cross-bedded at 0-10°	SW - FR			100	
		1 Is(50) d=1.54 a=1.32 MPa		7.0							
		1 Is(50) d=0.86 a=2.31 MPa		6.0		14.90-15.90m: iron induration, becoming orange and brown				100	14.68: Be, 0-5°, Pl, Ro, Ve
				5.0							15.85: Be, 0-5°, Ir, Ro, Is

TYPE C BOREHOLE DATABASE.GLB Log ADE CORED BOREHOLE LOG BILLBERGIA-STC-2148-18709.GPJ <-DrawingFile>> 21/12/2020 11:09 10:02:00.04 D:\git\Lab\and\In Situ\Tool - DGD | Lib: ADE 100.0\2018-08-01 Proj: ADE 100.0\2018-08-01

See Explanatory Notes for details of abbreviations & basis of descriptions.



CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 106

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

FILE / JOB NO : STC-2148-18709
 SHEET : 4 OF 4

POSITION : E: 328833.1, N: 6243198.6 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 20.25 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED: 27/11/2020 DATE COMPLETED : 27/11/2020 LOGGED BY : DK CHECKED BY : JP

DRILLING			MATERIAL					FRACTURES			
DRILLING & CASING	WATER	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral	NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
NMLC ↓	Not Encountered	1 Is(50) d=1.36 a=1.59 MPa	4.0		.....	SANDSTONE, fine to medium grained, grey with dark grey laminations, cross-bedded at 0-10° (continued)	SW • FR	●	|	100	16.72: shale lens, 30mm
		1 Is(50) d=1.74 a=2.15 MPa	3.0	17.0	.....	16.72-16.76m: carbonaceous speckles		●	|		17.37: E.C.R
				17.37	Hole Terminated at 17.37 m Target depth					
				18.0						
				2.0						
				19.0						
				1.0						
				20.0						
				0.0						
				21.0						
				-1.0						
				22.0						
				-2.0						
				23.0						
				-3.0						

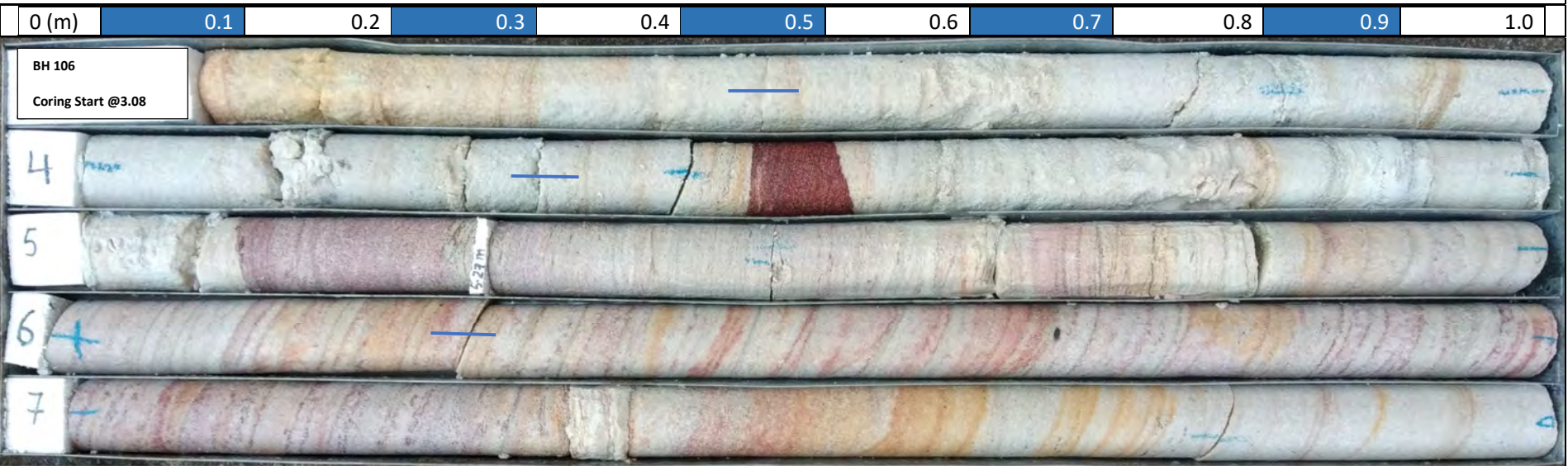
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See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE Consulting Group

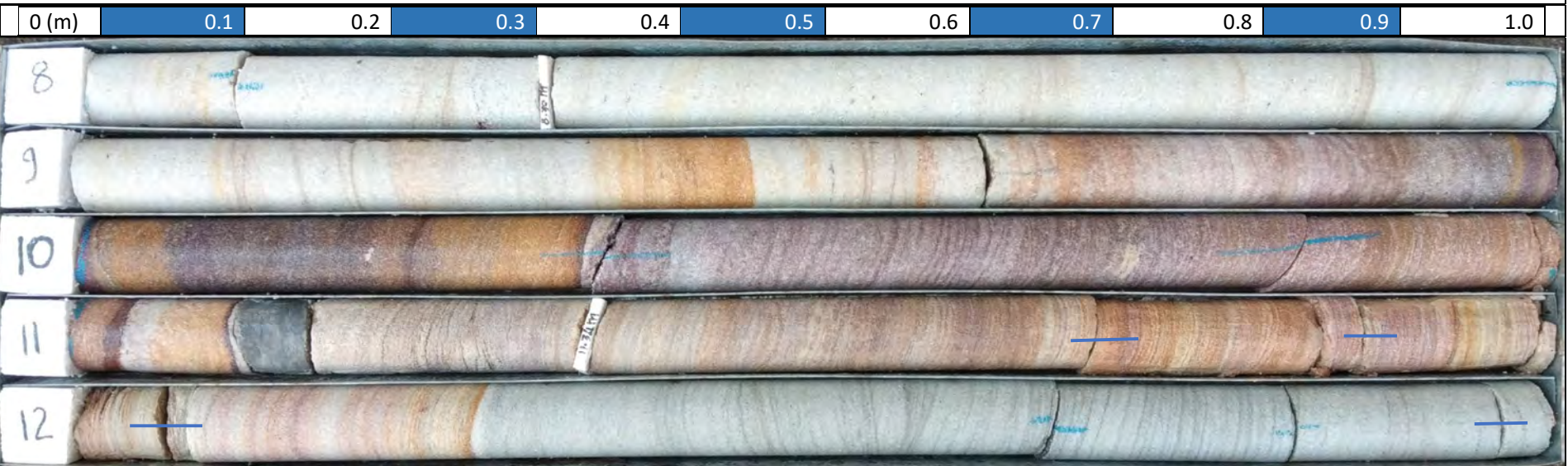
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 3.08 m – 8.00m
 Core Photo : No. 1




	Client:	Billbergia Pty Ltd	Borehole No:	BH 106
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	3.08 m – 8.00 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

ADE Consulting Group

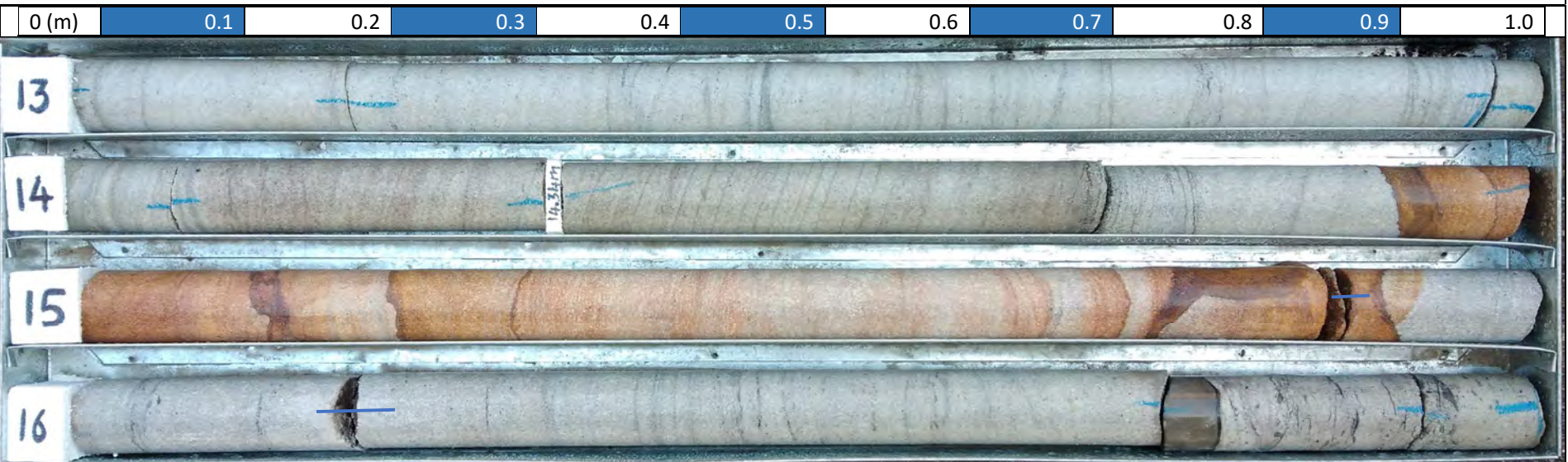
Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 8.00 m – 13.00m
Core Photo : No. 2




	Client:	Billbergia Pty Ltd	Borehole No:	BH 106
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	8.00 m – 13.00 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

ADE Consulting Group

Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 13.00 m – 17.00m
 Core Photo : No. 3

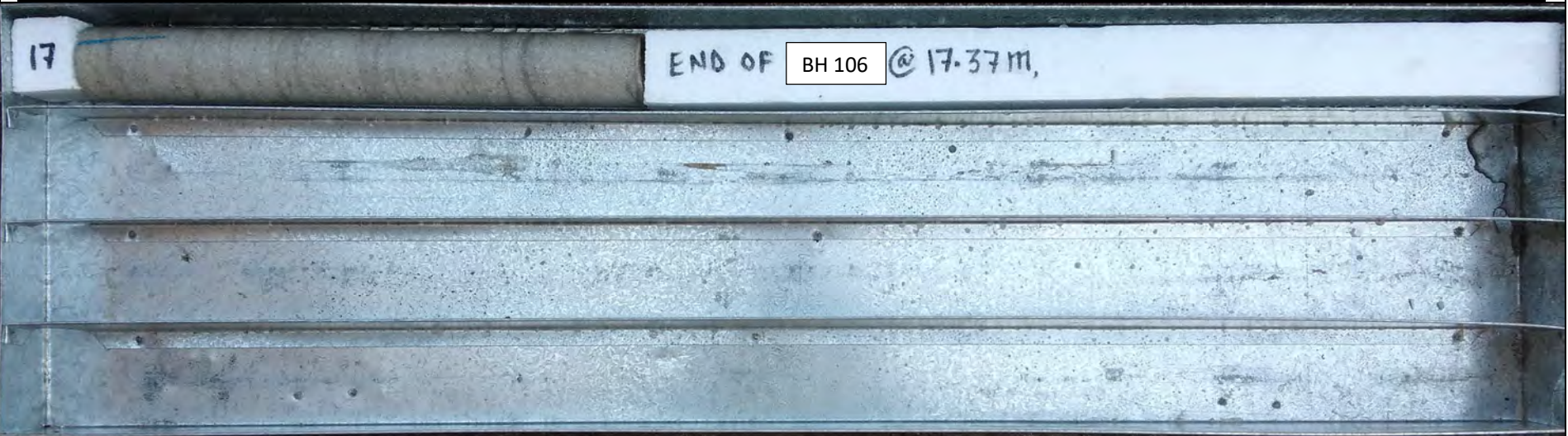



	Client:	Billbergia Pty Ltd	Borehole No:	BH 106
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	13.00 m – 17.00m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

ADE Consulting Group

Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 17.00 m – 17.37m
Core Photo : No. 4

0 (m) 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0



	Client:	Billbergia Pty Ltd	Borehole No:	BH 106
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	17.00 m – 17.37 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 107
 FILE / JOB NO : STC-2148-18709
 SHEET : 1 OF 4

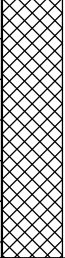
CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328866.3, N: 6243164.1 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 21.35 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED : 26/11/2020 DATE COMPLETED : 26/11/2020 DATE LOGGED : 26/11/2020 LOGGED BY : DK CHECKED BY : JP

DRILLING					MATERIAL											
DRILLING & CASING	WATER	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	PENETROMETER TEST				STRUCTURE & Other Observations
												5	10	15	20	
AD/T		Not Encountered	1.00m SPT 7,8,15/40mm N=R	21.0	1.0		1.28m	FILL: Silty SAND, fine to medium grained, dark brown and orange, with sandstone gravel	M						FILL	
				20.0				Continued as Cored Drill Hole								
				2.0												
				19.0												
				3.0												
				18.0												
				4.0												
				17.0												
				5.0												
				16.0												
				6.0												
				15.0												
				7.0												
				14.0												

TYPE C BOREHOLE DATABASE.GLB Log ADE NON-CORED LOG BILLBERGIA-STC-2148-18709.GPJ <-DrawingFile>> 21/12/2020 11:21 10.02.0004 D:\git\Lab and In Situ Tool - DGD | Lib: ADE 1.00.0.2018.08.01 Pjt: ADE 1.00.0.2018.08.01

See Explanatory Notes for details of abbreviations & basis of descriptions.



CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 107
 FILE / JOB NO : STC-2148-18709
 SHEET : 2 OF 4

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328866.3, N: 6243164.1 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 21.35 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED: 26/11/2020 DATE COMPLETED : 26/11/2020 LOGGED BY : DK CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES					
DRILLING & CASING	WATER	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral	NATURAL FRACTURE (mm)	ROD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other	
												VI	L	M	H	VH	EH
			21.0									
				1.0								
						1.28m START CORING AT 1.28m						
		1 Is(50) a=0.22 MPa	20.0			SANDSTONE , fine to medium grained, orange, red and grey, indistinctly cross-bedded at 0-10°, iron indurated	MW	●			1.52: Be, 20°, Pl, Ro, Is, clay	
				2.0			SW				96	2.07: Cs, 0-5°, 20mm, clayey sand 2.18: Cs, 0-5°, 30mm, clayey sand
		1 Is(50) a=0.25 MPa	19.0						●			2.47: Cs, 0-5°, 5mm 2.60: Cs, 10°, 5mm
				3.0								3.01: Ewz, 0-5°, 10mm, clayey sand
		1 Is(50) a=0.2 MPa	18.0						●			
				4.0								
		1 Is(50) a=0.39 MPa	17.0						●			4.59: Cs, 0-5°, 30mm, sandy clay
				5.0								
		1 Is(50) a=0.26 MPa	16.0					●			5.49: 2x Be, 20°, Pl, Ro, Co, spaced at 20 mm 5.70: Be, 10°, Pl, Ro, Co 5.85: Be, 0-5°, Pl, Ro, Co, 2mm	
				6.0							6.09: Ewz, 0-5°, 40mm 6.19: Cs, 4mm	
		1 Is(50) a=0.49 MPa	15.0					●			6.75: Cs, 0-5°, 10mm 6.95: Be, 0-5°, Pl, Ro, Co, Is	
				7.0								
		1 Is(50) a=0.37 MPa	14.0					●			7.68: be, 5°, Pl, Ro, ve	

TYPE C BOREHOLE DATABASE.GLB Log ADE CORED BOREHOLE LOG BILLBERGIA-STC-2148-18709.GPJ <<DrawingFile>> 21/12/2020 11:21:10.02:00.04 D:\geol\lab\and\in\Site\Tool - DGD | Lib: ADE 100.0\2018-08-01 Proj: ADE 100.0\2018-08-01

See Explanatory Notes for details of abbreviations & basis of descriptions.



CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 107

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

FILE / JOB NO : STC-2148-18709
 SHEET : 3 OF 4

POSITION : E: 328866.3, N: 6243164.1 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 21.35 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED: 26/11/2020 DATE COMPLETED : 26/11/2020 LOGGED BY : DK CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES					
DRILLING & CASING	WATER	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral	NATURAL FRACTURE (mm)	ROD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other	
												VI	L	M	H	VH	EH
NMLC						SANDSTONE, fine to medium grained, orange, red and grey, indistinctly cross-bedded at 0-10°, iron indurated (continued)	SW					8.18: Be, 0-5°, Pl, Ro, Is
		1 Is(50) a=0.43 MPa	13.0								96	8.38: Ewz, 10mm
			9.0									8.88: Jt, 20°, Pl, Ro, Co, Is
		1 Is(50) a=3.31 MPa	12.0									9.18: Be, 0-30°, Pl, Ro, Is
			10.0									9.34: Be, 0°, Pl, Ro, Is
		1 Is(50) a=0.1 MPa	11.0									9.82: Be, 0-5°, Pl, Ro, Is
			10.0									9.94: Cs, 0-5°, 20mm, with calyey sand
			11.0									10.14: Ewz, 0-20°, 30mm, sandy clay
			11.0									10.20: Be, 0-5°, Pl, Ro, Is
		1 Is(50) a=0.4 MPa	12.0					SW - FR				10.60: Ewz, 0-5°, 20mm
			9.0								10.72: Ewz, 5°, 5mm	
		1 Is(50) a=0.82 MPa	13.0									
		1 Is(50) a=1.07 MPa	8.0								100	13.29: Cs, 0°, 5 mm
			14.0									
		1 Is(50) a=1.12 MPa	7.0								100	15.06: Be, 0-5°, Pl, Ro, Ve
			15.0									
			6.0									

TYPE C BOREHOLE DATABASE.GLB Log ADE CORED BOREHOLE LOG BILLBERGIA-STC-2148-18709.GPJ <<DrawingFile>> 21/12/2020 11:21 10:02:00.04 D:\git\Lab\and\In Situ\Tool - DGD | Lib: ADE 100.0.2018-08-01 Proj: ADE 100.0.2018-08-01

See Explanatory Notes for details of abbreviations & basis of descriptions.



CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 107
FILE / JOB NO : STC-2148-18709
SHEET : 4 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328866.3, N: 6243164.1 (MGA94 Zone 56) **SURFACE ELEVATION (RL) :** 21.35 (m AHD) **ANGLE FROM HORIZONTAL :** 90°

EXCAVATION METHOD : HANJIN D&B-8D **MOUNTING :** Track **CONTRACTOR :** ROCKWELL **DRILLER :** CN

DATE STARTED: 26/11/2020 **DATE COMPLETED :** 26/11/2020 **LOGGED BY :** DK **CHECKED BY :** JP

DRILLING			MATERIAL				FRACTURES				
DRILLING & CASING	WATER	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral	NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
NMLC ↓	Not Encountered	1 Is(50) a=1.61 MPa	5.0	7.0	•••••	SANDSTONE, fine to medium grained, orange, red and grey, indistinctly cross-bedded at 0-10°, iron indurated (<i>continued</i>)	SW • FR	●	|	100	
		1 Is(50) a=1.48 MPa	4.0		•••••						
				17.82		Hole Terminated at 17.82 m Target depth					17.82: E.C.R
			18.0	3.0							
			19.0	2.0							
			20.0	1.0							
			21.0	0.0							
			22.0	-1.0							
			23.0	-2.0							

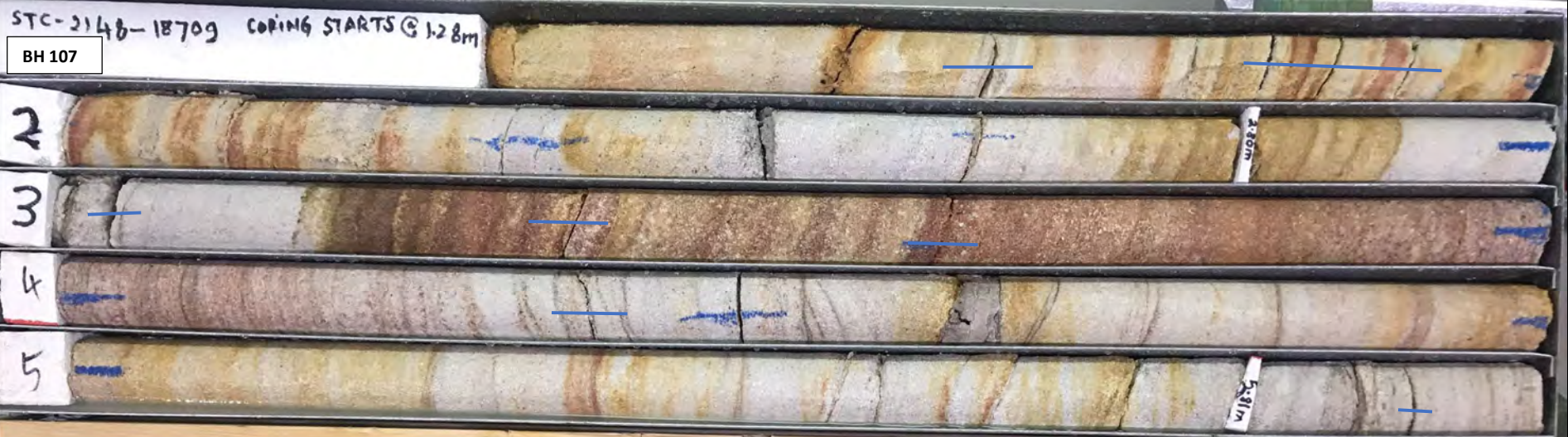
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See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE Consulting Group

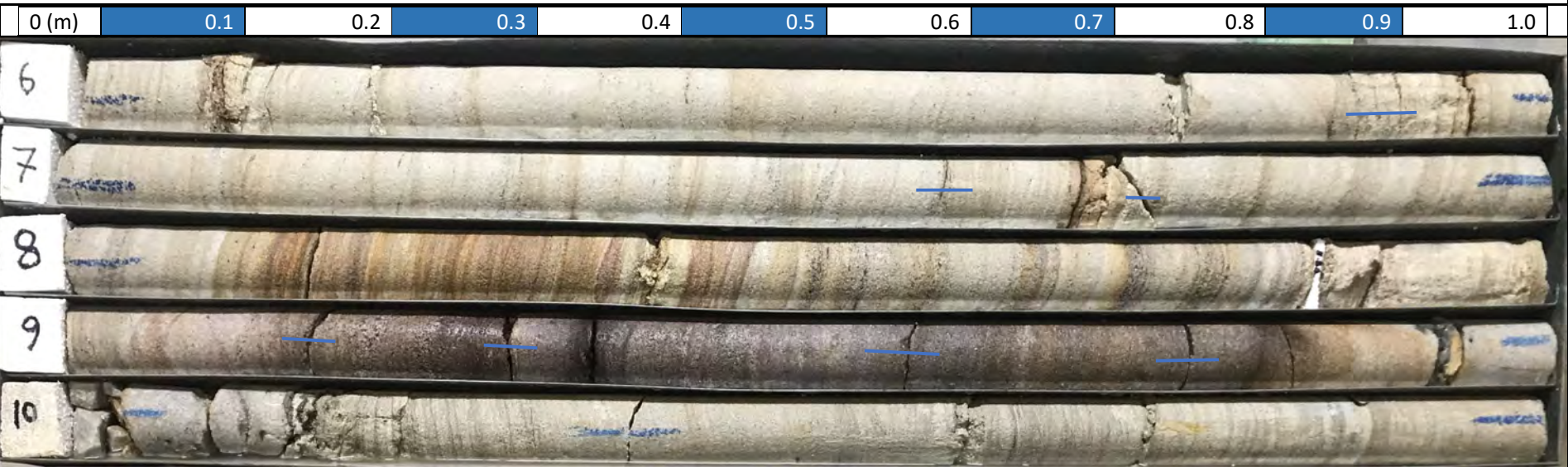
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 1.28 m – 6.00m
 Core Photo : No. 1




	Client:	Billbergia Pty Ltd	Borehole No:	BH 107
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	1.28 m – 6.00 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

ADE Consulting Group

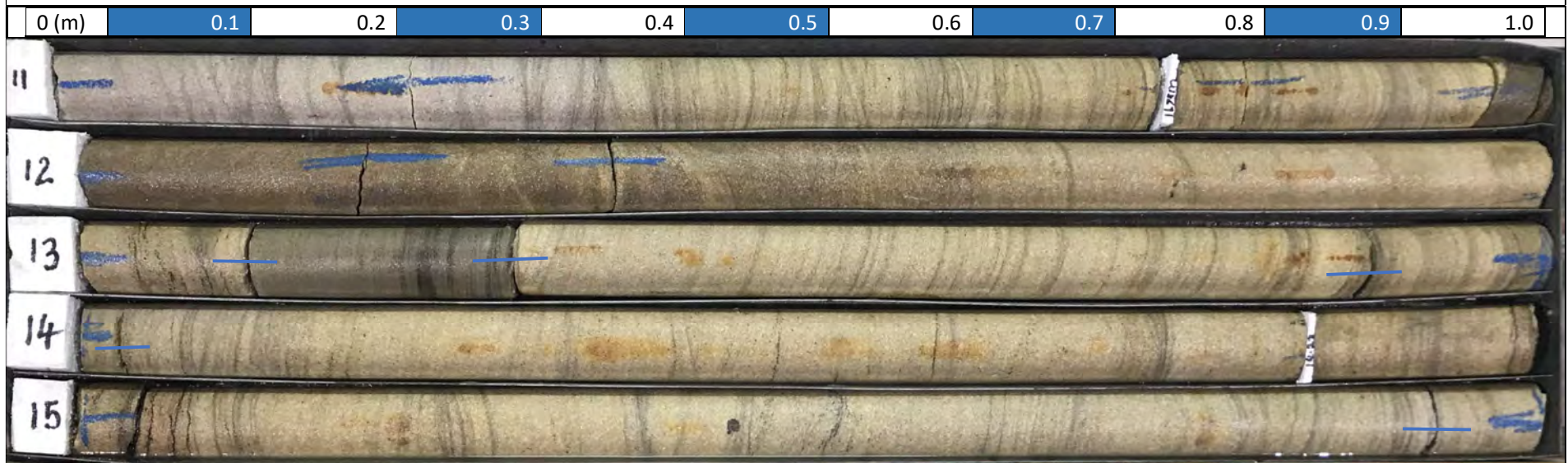
Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 6.00 m – 11.00m
Core Photo : No. 2




	Client:	Billbergia Pty Ltd	Borehole No:	BH 107
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	6.00 m – 11.00 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

ADE Consulting Group

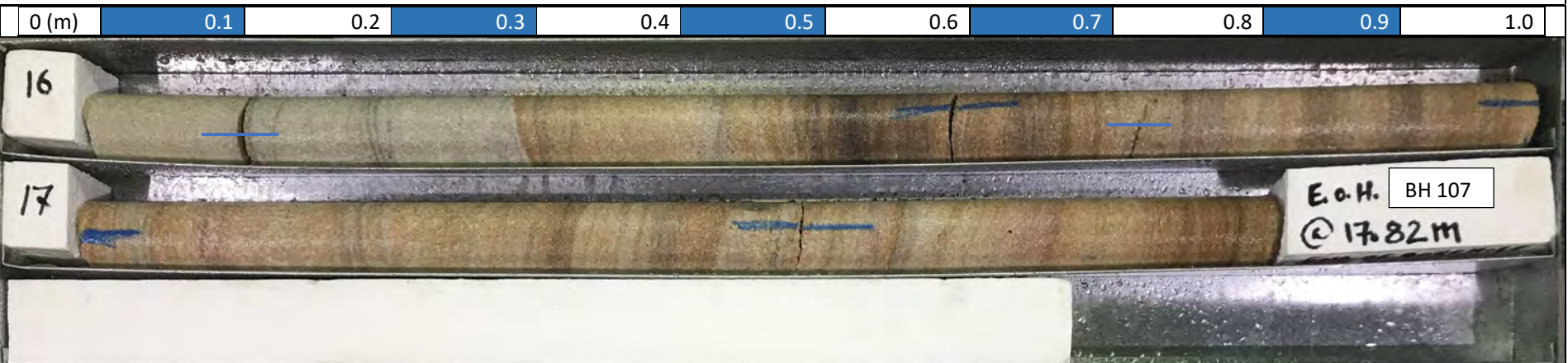
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 11.00 m – 16.00m
 Core Photo : No. 3




	Client:	Billbergia Pty Ltd	Borehole No:	BH 107
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	11.00 m – 16.00 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

ADE Consulting Group

Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 16.00 m – 17.82 m
Core Photo : No. 4



	Client:	Billbergia Pty Ltd	Borehole No:	BH 107
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	16.00 m – 17.82 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 108
 FILE / JOB NO : STC-2148-18709
 SHEET : 1 OF 3

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328873.0, N: 6243204.5 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 19.25 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED : 27/11/2020 DATE COMPLETED : 27/11/2020 DATE LOGGED : 27/11/2020 LOGGED BY : DK CHECKED BY : JP

DRILLING				MATERIAL													
PROGRESS	DRILLING & CASING	WATER	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	PENETROMETER TEST				STRUCTURE & Other Observations
													5	10	15	20	
ADIT			Not Encountered	SPT 2,3,3 N=6	19.0	0.50m	[Cross-hatched pattern]		FILL: Silty SAND, fine to medium grained, dark brown, trace of tree rootlets	M						FILL	
					1.00m	1.00m	[Diagonal lines pattern]		FILL: Silty SAND, fine to medium grained, orange and brown, with clay bands								
					1.45m	1.00m	[Diagonal lines pattern]	CI-CH	Sandy CLAY, medium to high plasticity, grey and brown, fine to medium grained sand	F - St					RESIDUAL SOIL		
					18.0	2.0			Continued as Cored Drill Hole	St - VSt							
					17.0												
					3.0												
					16.0												
					4.0												
					15.0												
					5.0												
					14.0												
					6.0												
					13.0												
					7.0												
					12.0												
					8.0												

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See Explanatory Notes for details of abbreviations & basis of descriptions.



CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 108

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

FILE / JOB NO : STC-2148-18709
 SHEET : 2 OF 3

POSITION : E: 328873.0, N: 6243204.5 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 19.25 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED: 27/11/2020 DATE COMPLETED : 27/11/2020 LOGGED BY : DK CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES				
DRILLING & CASING	WATER	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral	NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
			19.0								
			18.0								
			2.0			2.13m START CORING AT 2.13m					
			17.0			SANDSTONE, fine to medium grained, orange and pale grey, extremely weathered, very low estimated strength, iron indurated	XW HW				2.17: Ewz, 0-5°, 70mm 2.35: Be, 20°, Pl, Ro, Is
		1 Is(50) d=0.1 a=0 MPa	3.0			2.90m 3.00m CORE LOSS 0.10m					3.07: Be, 0-5°, Ir, Ro, Is
			16.0			SANDSTONE, fine to medium grained, pale grey, orange, and red, indistinctly cross bedded at 0-10°	HW				
		1 Is(50) d=0.11 a=0.06 MPa	4.0								3.90: Cs, 0°, Pl, Ro, Is 3.98: Ewz, 0°, 100 mm 4.02: Ewz, 0-5°, 40mm 4.07: Be, 0-5°, Pl, Ro, Is 4.12: Ewz, 30mm 4.17: Be, 0-10°, Pl, Ro, Is
			15.0				MW				
		1 Is(50) d=0.36 a=0.15 MPa	5.0								
			14.0								5.24: Ewz, 0-5°, 10mm, sandy clay 5.38: Jt, 50°, Pl, Ro, Healed 5.40: Cs, 0°, 5 mm 5.51: Be, 0°, Pl, Ro, Co
			13.0				SW				
		1 Is(50) d=0.91 a=1.11 MPa	6.0								
			12.0								6.30: Ewz, 10°, 5 mm 6.60: Cs, 10°, 5 mm
			8.0								7.55: Ewz, 0°, 5 mm
		1 Is(50) d=0.75 a=1.36 MPa									

TYPE C BOREHOLE DATABASE.GLB Log ADE CORED BOREHOLE LOG BILLBERGIA-STC-2148-18709.GPJ <-DrawingFile> 21/12/2020 11:50 10.02.00.04 D:\git\Lab\and\In Situ\Tool - DGD | Lib: ADE 100.0.2018-08-01 Proj: ADE 100.0.2018-08-01

See Explanatory Notes for details of abbreviations & basis of descriptions.



CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 108

CLIENT : Billbergia Pty Ltd
 LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

FILE / JOB NO : STC-2148-18709
 SHEET : 3 OF 3

POSITION : E: 328873.0, N: 6243204.5 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 19.25 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D MOUNTING : Track CONTRACTOR : ROCKWELL DRILLER : CN

DATE STARTED: 27/11/2020 DATE COMPLETED : 27/11/2020 LOGGED BY : DK CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES				
DRILLING & CASING	WATER	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral	NATURAL FRACTURE (mm)	ROD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
		1 Is(50) d=0.93 a=1.72 MPa	11.0			SANDSTONE, fine to medium grained, pale grey, orange, and red, indistinctly cross bedded at 0-10° <i>(continued)</i>	SW	●		99	
		1 Is(50) d=2.04 a=0.72 MPa	10.0					●		100	9.15: Be, 0-5°, Pl, Sm, Is
		1 Is(50) d=1.5 a=0.77 MPa	9.0					●		100	10.50: Be, 0-5°, Pl, Sm, Is
		1 Is(50) d=1.74 a=1.45 MPa	8.0					●		100	11.10: Be, 0-10°, Un, Ro, Is
			7.0							100	11.44: 2x Be, 5°, Pl, Ro, Ve, Spaced at 50 mm 11.58: Be, 5°, Pl, Ro, Cl
		1 Is(50) d=1.01 a=0.98 MPa	6.0					●		95	11.92: Be, 0°, Un, Ro, Is 12.02: Be, 20°, Pl, Ro, Co 12.15: Be, 0°, Pl, Ro, Is
		1 Is(50) d=1.87 a=1.82 MPa	5.0					●		100	14.38: Cs, 0°, 5 mm
		1 Is(50) d=1.88 a=1.54 MPa	4.0					●		100	14.78: Be, 5°, Pl, Sm, Is
		1 Is(50) d=1.08 a=1.25 MPa	3.0					●		100	15.20: Be, 0°, Pl, Ro, Is 15.48: Be, 0-5°, Pl, Ro, Is
			2.0							100	15.84: Ewz, 10°, 5 mm
			1.0							100	16.00: E.C.R
			0.0							100	

TYPE C BOREHOLE DATABASE.GLB Log ADE CORED BOREHOLE LOG BILLBERGIA-STC-2148-18709.GPJ <<DrawingFile>> 21/12/2020 11:50 10:02:00.04 D:\git\Lab\and\In Situ\Tool - DGD | Lib: ADE 100.0.2018-08-01 Proj: ADE 100.0.2018-08-01

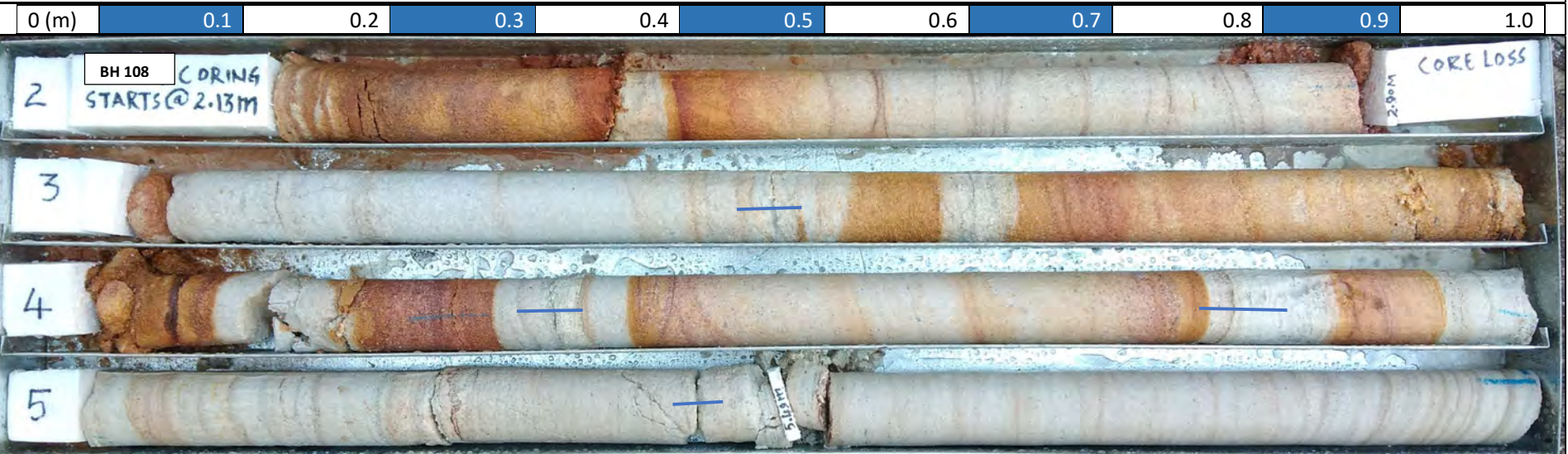
See Explanatory Notes for details of abbreviations & basis of descriptions.


Hole Terminated at 16.00 m
 Target depth



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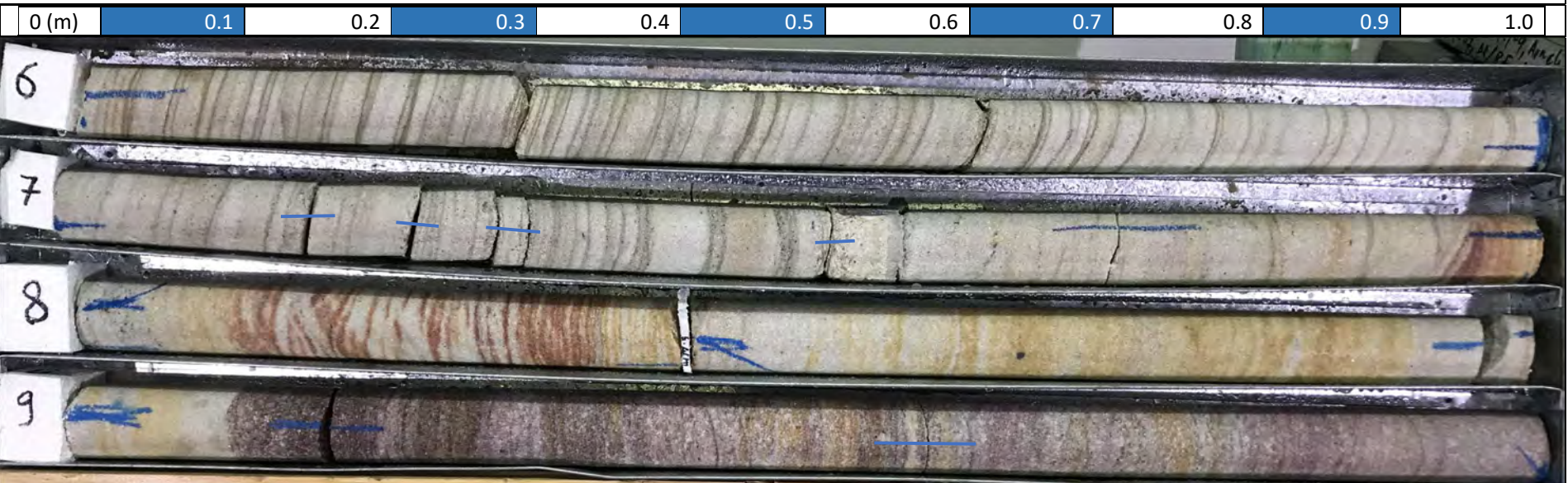
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 2.13 m – 6.00m
 Core Photo : No. 1




	Client:	Billbergia Pty Ltd	Borehole No:	BH 108
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	2.13 m – 6.00 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

ADE Consulting Group

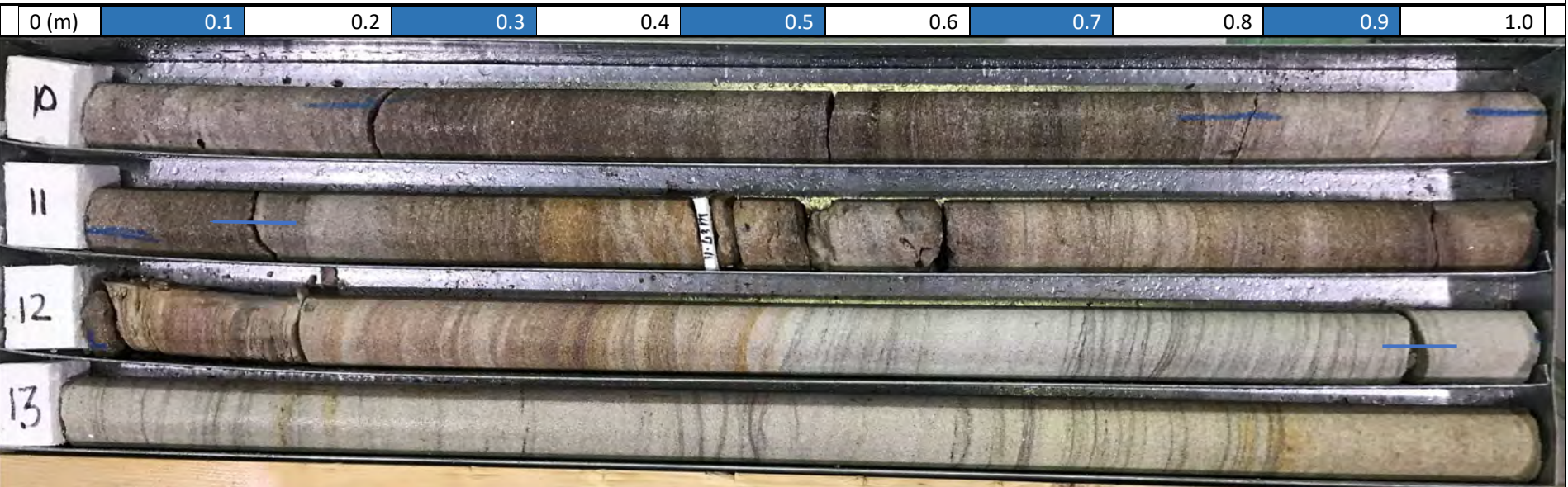
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 6.00 m – 10.00 m
 Core Photo : No. 2




	Client:	Billbergia Pty Ltd	Borehole No:	BH 108
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	6.00 m – 10.00 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

ADE Consulting Group

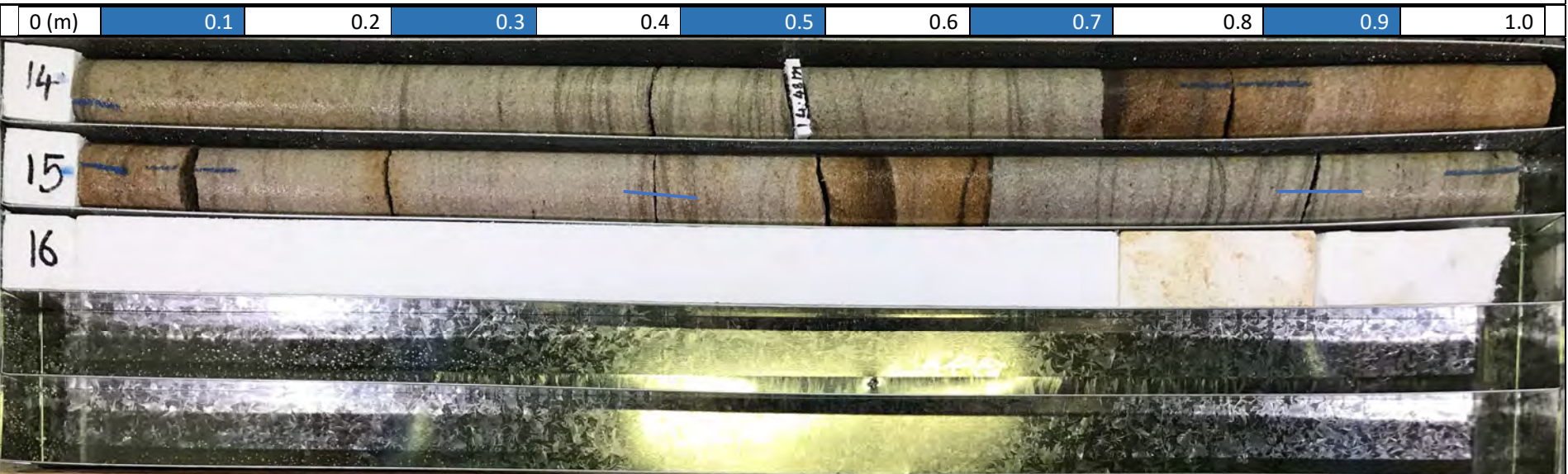
Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 10.00 m – 14.00 m
Core Photo : No. 3




	Client:	Billbergia Pty Ltd	Borehole No:	BH 108
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	10.00 m – 14.00 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

ADE Consulting Group

Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 14.00 m – 16.00 m
 Core Photo : No. 4



 ADECONSULTINGGROUP <small>SOLUTIONS THROUGH INNOVATION</small>	Client:	Billbergia Pty Ltd	Borehole No:	BH 108
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	14.00 m – 16.00m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

Appendix III – Laboratory Test Results

Material Test Report



Report Number: STC-2148-18709-1
Issue Number: 1
Date Issued: 17/12/2020
Client: Billbergia Pty Ltd
 26 – 42 Eden Street, , Arncliffe NSW 2205
Project Number: STC-2148-18709
Project Name: Proposed New Development
Project Location: 26 – 42 Eden Street, Arncliffe 2205
Work Request: 2226
Sample Number: 20-2226A
Date Sampled: 24/10/2020
Dates Tested: 09/12/2020 - 11/12/2020
Remarks: SLS Reference: STC-2148-18709 BH1, BH3 - BH6
Sample Location: BH3 , Depth: 1.0-1.4m
Material: Sandy Clay: light brown

Sydney Laboratory Services
 Construction and Material Testing Laboratory
 7/24-28 Skarratt Street N Silverwater NSW 2128
 Phone: (02) 9648 6669
 Email: Ashwin.Tatikonda@ade.group



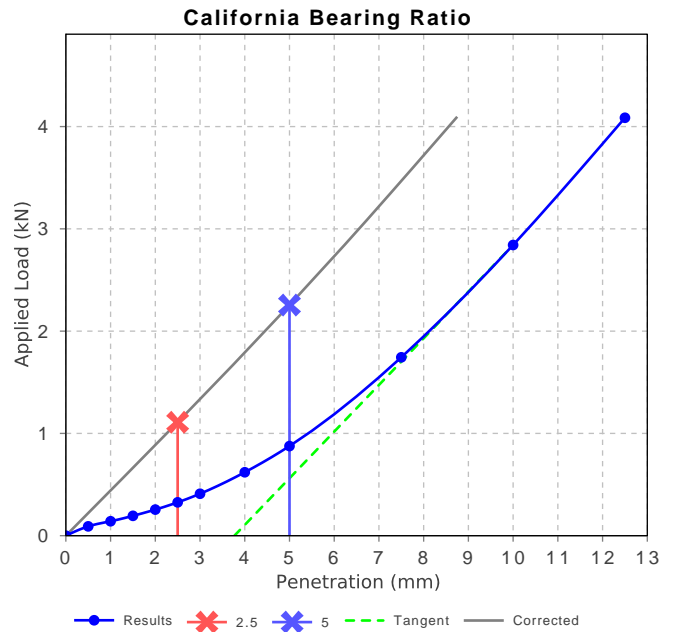
Accredited for compliance with ISO/IEC 17025 - Testing

Ashwin Tatikonda

Approved Signatory: Ashwin Tatikonda
Laboratory Manager

NATA Accredited Laboratory Number: 14664

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	11		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual/ Tactile		
Maximum Dry Density (t/m ³)	1.94		
Optimum Moisture Content (%)	13.0		
Laboratory Density Ratio (%)	100.0		
Laboratory Moisture Ratio (%)	100.0		
Moisture Content at Placement (%)	12.8		
Moisture Content Top 30mm (%)	13.4		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours	24		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0		



Material Test Report



Report Number: STC-2148-18709-1
Issue Number: 1
Date Issued: 17/12/2020
Client: Billbergia Pty Ltd
 26 – 42 Eden Street, Arncliffe NSW 2205
Project Number: STC-2148-18709
Project Name: Proposed New Development
Project Location: 26 – 42 Eden Street, Arncliffe 2205
Work Request: 2226
Sample Number: 20-2226B
Date Sampled: 24/10/2020
Dates Tested: 09/12/2020 - 11/12/2020
Remarks: SLS Reference: STC-2148-18709 BH1, BH3 - BH6
Sample Location: BH5 , Depth: 0.5-1.0m
Material: Gravelly Clayey SAND: light brown

Sydney Laboratory Services
 Construction and Material Testing Laboratory
 7/24-28 Skarratt Street N Silverwater NSW 2128
 Phone: (02) 9648 6669
 Email: Ashwin.Tatikonda@ade.group



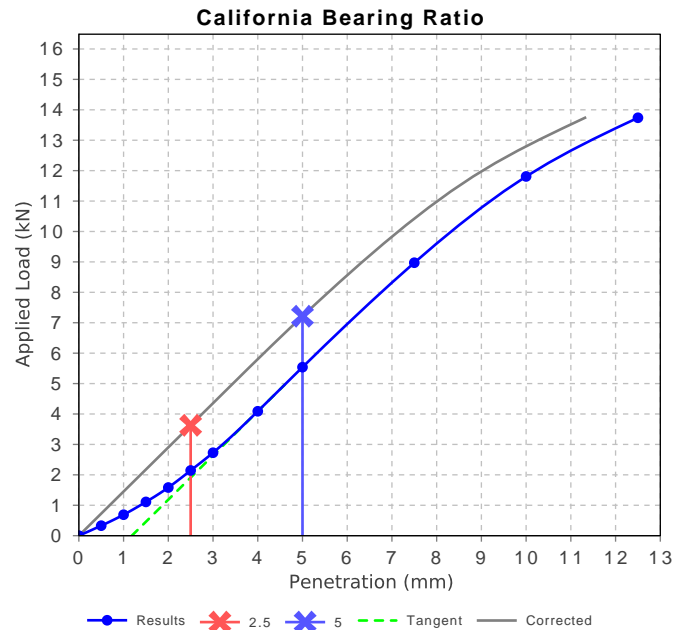
Accredited for compliance with ISO/IEC 17025 - Testing

Ashwin Tatikonda

Approved Signatory: Ashwin Tatikonda
Laboratory Manager

NATA Accredited Laboratory Number: 14664

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	35		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual/ Tactile		
Maximum Dry Density (t/m ³)	1.98		
Optimum Moisture Content (%)	9.0		
Laboratory Density Ratio (%)	100.5		
Laboratory Moisture Ratio (%)	100.0		
Moisture Content at Placement (%)	8.9		
Moisture Content Top 30mm (%)	9.8		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours	24		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	10.8		



Material Test Report



Report Number: STC-2148-18709-1
Issue Number: 1
Date Issued: 17/12/2020
Client: Billbergia Pty Ltd
 26 – 42 Eden Street, , Arncliffe NSW 2205
Project Number: STC-2148-18709
Project Name: Proposed New Development
Project Location: 26 – 42 Eden Street, Arncliffe 2205
Work Request: 2226
Sample Number: 20-2226C
Date Sampled: 24/10/2020
Dates Tested: 09/12/2020 - 10/12/2020
Remarks: SLS Reference: STC-2148-18709 BH1, BH3 - BH6
Sample Location: **BH4 , Depth: 2.0m**
Material: Sandy Clay: light brown

Sydney Laboratory Services
 Construction and Material Testing Laboratory
 7/24-28 Skarratt Street N Silverwater NSW 2128
 Phone: (02) 9648 6669
 Email: Ashwin.Tatikonda@ade.group



Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Ashwin Tatikonda
 Laboratory Manager

NATA Accredited Laboratory Number: 14664

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	32		
Plastic Limit (%)	11		
Plasticity Index (%)	21		
Linear Shrinkage (AS1289 3.4.1)		Min	Max
Linear Shrinkage (%)	5.5		
Cracking Crumbling Curling			

Material Test Report



Report Number: STC-2148-18709-1
Issue Number: 1
Date Issued: 17/12/2020
Client: Billbergia Pty Ltd
 26 – 42 Eden Street, , Arncliffe NSW 2205
Project Number: STC-2148-18709
Project Name: Proposed New Development
Project Location: 26 – 42 Eden Street, Arncliffe 2205
Work Request: 2226
Sample Number: 20-2226D
Date Sampled: 24/10/2020
Dates Tested: 09/12/2020 - 10/12/2020
Remarks: SLS Reference: STC-2148-18709 BH1, BH3 - BH6
Sample Location: **BH1 , Depth: 0.5-1.0m**
Material: Sandy Clay: light brown

Sydney Laboratory Services
 Construction and Material Testing Laboratory
 7/24-28 Skarratt Street N Silverwater NSW 2128
 Phone: (02) 9648 6669
 Email: Ashwin.Tatikonda@ade.group



Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Ashwin Tatikonda
 Laboratory Manager

NATA Accredited Laboratory Number: 14664

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	29		
Plastic Limit (%)	12		
Plasticity Index (%)	17		
Linear Shrinkage (AS1289 3.4.1)		Min	Max
Linear Shrinkage (%)	4.0		
Cracking Crumbling Curling			

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Project Name: Proposed New Development
Project Location: 26 – 42 Eden Street, Arncliffe 2205
Work Request: 2226
Date Sampled: 24/10/2020
Dates Tested: 09/12/2020 - 15/12/2020
Remarks: SLS Reference: STC-2148-18709 BH1, BH3 - BH6
Material: Sandy Clay

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Laboratory Manager

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Moisture Content AS 1289 2.1.1

Sample Number	Sample Location	Moisture Content	Material
20-2226C	BH4 , Depth: 2.0m	11.6 %	Sandy Clay: light brown
20-2226D	BH1 , Depth: 0.5-1.0m	9.5 %	Sandy Clay: light brown

CERTIFICATE OF ANALYSIS

Work Order : ES2043474 Client : ADE Consulting Group Pty Ltd Contact : info Address : 6/7 MILLENIUM COURT SILVERWATER NSW 2128 Telephone : ---- Project : STC-2148-18709 Order number : ---- C-O-C number : ---- Sampler : QJ Site : ---- Quote number : EN/097/20 No. of samples received : 4 No. of samples analysed : 4	Page : 1 of 2 Laboratory : Environmental Division Sydney Contact : Shane Ellis Address : 277-289 Woodpark Road Smithfield NSW Australia 2164 Telephone : +61 2 8784 8555 Date Samples Received : 08-Dec-2020 11:20 Date Analysis Commenced : 11-Dec-2020 Issue Date : 15-Dec-2020 15:40
--	--



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

				Sample ID	BH1 0.5m-1.0m	BH4 1.0m-1.5m	BH4 2m	BH6 2.5m	----
				Sampling date / time	[08-Dec-2020]	[08-Dec-2020]	[08-Dec-2020]	[08-Dec-2020]	----
Compound	CAS Number	LOR	Unit		ES2043474-001	ES2043474-002	ES2043474-003	ES2043474-004	-----
					Result	Result	Result	Result	----
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		5.4	7.5	7.6	6.6	----
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		163	55	62	25	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		10.0	9.1	12.1	14.2	----
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		90	<10	<10	<10	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		110	60	70	<10	----

QUALITY CONTROL REPORT

Work Order	: ES2043474	Page	: 1 of 3
Client	: ADE Consulting Group Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: info	Contact	: Shane Ellis
Address	: 6/7 MILLENIUM COURT SILVERWATER NSW 2128	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: STC-2148-18709	Date Samples Received	: 08-Dec-2020
Order number	: ----	Date Analysis Commenced	: 11-Dec-2020
C-O-C number	: ----	Issue Date	: 15-Dec-2020
Sampler	: QJ		
Site	: ----		
Quote number	: EN/097/20		
No. of samples received	: 4		
No. of samples analysed	: 4		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA002: pH 1:5 (Soils) (QC Lot: 3416535)									
ES2044028-001	Anonymous	EA002: pH Value	----	0.1	pH Unit	5.8	5.8	0.00	0% - 20%
ES2044028-006	Anonymous	EA002: pH Value	----	0.1	pH Unit	7.4	7.4	0.00	0% - 20%
EA010: Conductivity (1:5) (QC Lot: 3416538)									
ES2044028-001	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	383	389	1.55	0% - 20%
ES2044028-006	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	124	122	2.12	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3416539)									
ES2043474-003	BH4 2m	EA055: Moisture Content	----	0.1	%	12.1	13.8	13.3	0% - 50%
ES2044028-010	Anonymous	EA055: Moisture Content	----	0.1	%	15.3	15.4	0.00	0% - 50%
ED040S: Soluble Major Anions (QC Lot: 3416537)									
ES2044028-001	Anonymous	ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	20	30	45.7	No Limit
ES2044028-006	Anonymous	ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	50	50	0.00	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 3416536)									
ES2044028-001	Anonymous	ED045G: Chloride	16887-00-6	10	mg/kg	910	920	1.16	0% - 20%
ES2044028-006	Anonymous	ED045G: Chloride	16887-00-6	10	mg/kg	40	40	0.00	No Limit



Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike	Spike Recovery (%)	Recovery Limits (%)	
					Concentration	LCS	Low	High
EA010: Conductivity (1:5) (QCLot: 3416538)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	102	92.0	108
ED040S: Soluble Major Anions (QCLot: 3416537)								
ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	150 mg/kg	100	80.0	120
ED045G: Chloride by Discrete Analyser (QCLot: 3416536)								
ED045G: Chloride	16887-00-6	10	mg/kg	<10	250 mg/kg	99.1	75.0	125
				<10	5000 mg/kg	98.9	79.0	117

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
				Concentration	MS	Low	High
ED045G: Chloride by Discrete Analyser (QCLot: 3416536)							
ES2044028-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/kg	120	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2043474	Page	: 1 of 4
Client	: ADE Consulting Group Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: info	Telephone	: +61 2 8784 8555
Project	: STC-2148-18709	Date Samples Received	: 08-Dec-2020
Site	: ----	Issue Date	: 15-Dec-2020
Sampler	: QJ	No. of samples received	: 4
Order number	: ----	No. of samples analysed	: 4

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**



Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method Container / Client Sample ID(s)	Extraction / Preparation			Analysis			
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue	
EA002: pH 1:5 (Soils)							
Soil Glass Jar - Unpreserved BH1 0.5m-1.0m, BH4 2m,	BH4 1.0m-1.5m, BH6 2.5m	----	----	----	14-Dec-2020	12-Dec-2020	2

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: **x** = Holding time breach ; **✓** = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA002: pH 1:5 (Soils)								
Soil Glass Jar - Unpreserved (EA002) BH1 0.5m-1.0m, BH4 2m,	BH4 1.0m-1.5m, BH6 2.5m	08-Dec-2020	11-Dec-2020	15-Dec-2020	✓	14-Dec-2020	12-Dec-2020	x
EA010: Conductivity (1:5)								
Soil Glass Jar - Unpreserved (EA010) BH1 0.5m-1.0m, BH4 2m,	BH4 1.0m-1.5m, BH6 2.5m	08-Dec-2020	11-Dec-2020	15-Dec-2020	✓	14-Dec-2020	08-Jan-2021	✓
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055) BH1 0.5m-1.0m, BH4 2m,	BH4 1.0m-1.5m, BH6 2.5m	08-Dec-2020	----	----	----	11-Dec-2020	22-Dec-2020	✓
ED040S : Soluble Sulfate by ICPAES								
Soil Glass Jar - Unpreserved (ED040S) BH1 0.5m-1.0m, BH4 2m,	BH4 1.0m-1.5m, BH6 2.5m	08-Dec-2020	11-Dec-2020	05-Jan-2021	✓	14-Dec-2020	08-Jan-2021	✓
ED045G: Chloride by Discrete Analyser								
Soil Glass Jar - Unpreserved (ED045G) BH1 0.5m-1.0m, BH4 2m,	BH4 1.0m-1.5m, BH6 2.5m	08-Dec-2020	11-Dec-2020	05-Jan-2021	✓	14-Dec-2020	08-Jan-2021	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Chloride Soluble By Discrete Analyser	ED045G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chloride Soluble By Discrete Analyser	ED045G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chloride Soluble By Discrete Analyser	ED045G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride Soluble By Discrete Analyser	ED045G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

<i>Analytical Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
pH (1:5)	EA002	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Electrical Conductivity (1:5)	EA010	SOIL	In house: Referenced to Rayment and Lyons 3A1 and APHA 2510. Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Major Anions - Soluble	ED040S	SOIL	In house: Soluble Anions are determined off a 1:5 soil / water extract by ICPAES.
Chloride Soluble By Discrete Analyser	ED045G	SOIL	In house: Referenced to APHA 4500-Cl- E. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm. Analysis is performed on a 1:5 soil / water leachate.
<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.

Test report - uniaxial compressive strength

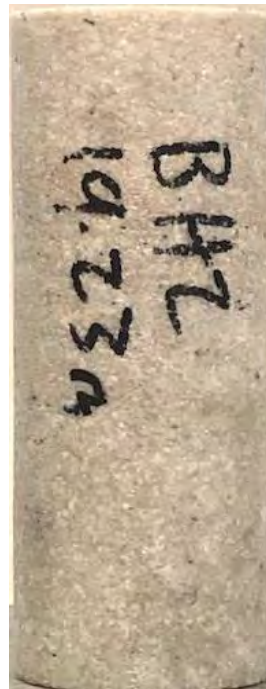
client: ADE CONSULTING GROUP	job no: TESTSYDS 00055AA
Principal:	report date: 11 December 2020
project: STC-2148-18709	borehole: BH2
location:	date received: 2 December 2020
test procedure: AS 4133.1.1.1 and 4133.4.2.1	page 1 of 1
test apparatus: Avery with 200 kN CAS load cell 4222	

All samples were tested in an "As Received" condition.
 Top platen 228 mm, Bottom platen 75 mm
 The sample at 10.43 m was shorter than the Standard's recommendation.

QESTLab work order ID	height	uniaxial compressive strength	wet density	sample description	Client's Sample ID
depth	average diameter	MPa	moisture content	bedding/foliation	failure mechanism
QESTLab sample ID	test duration	height/dia ratio			
SYDS20W00078 10.43 to 10.57 m	8 Dec 20	117 mm	2.4 t/m ³	Sandstone	
SYDS20S00539	7.98 min	52.0 mm	7.0 %	Bedding planes are at an angle of 65° to the axis of loading	Shear
SYDS20W00078 19.23 to 19.39 m	8 Dec 20	145 mm	2.4 t/m ³	Sandstone	
SYDS20S00540	11.54 min	52.0 mm	6.5 %	Bedding planes are at an angle of 70° to the axis of loading	Shear



10.43 to 10.57 m



19.23 to 19.39 m



SYDS_001R

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Accredited for compliance with ISO/IEC 17025 - Testing
 The results of the tests, calibrations, and/or measurements included in this document are traceable to Australian/national standards.

NATA Accredited Laboratory
 No. 431
 Authorised Signature:
Alan Cocks
 Rock Testing Manager

Date: 11 Dec 2020



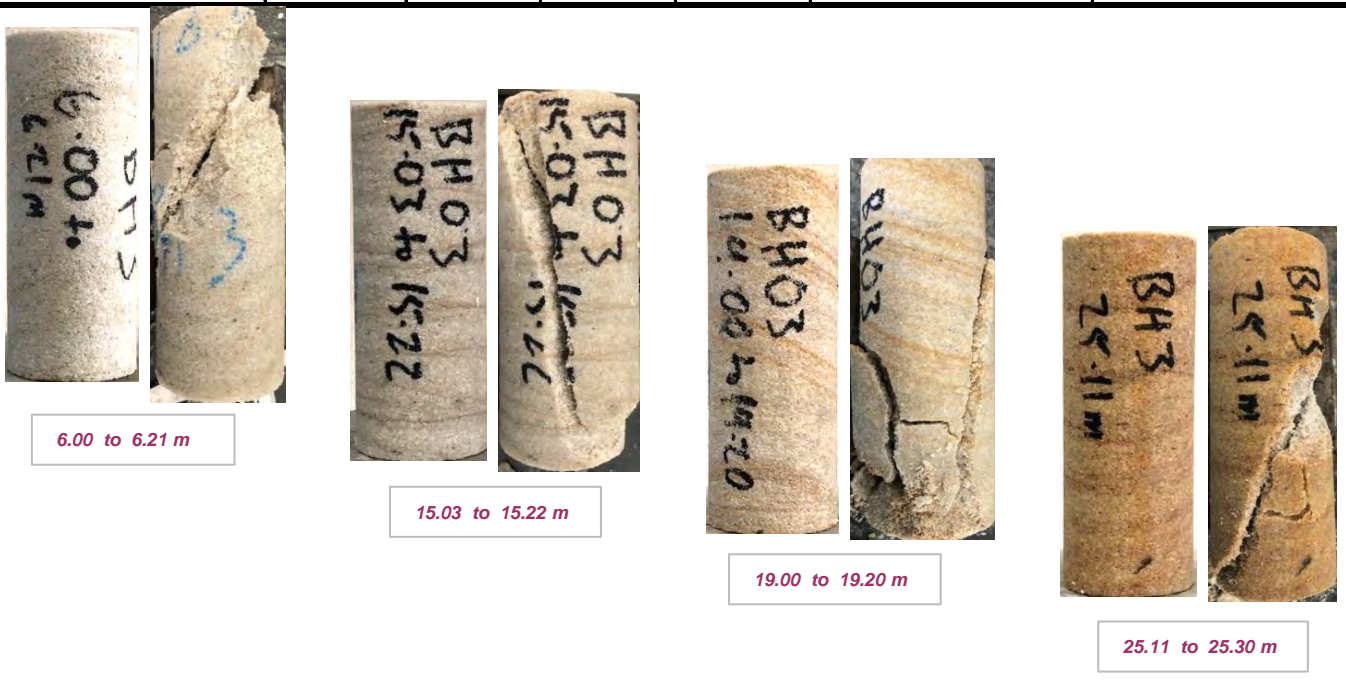
Test report - uniaxial compressive strength

client: ADE CONSULTING GROUP	job no: TESTSYDS 00055AA
Principal:	report date: 11 December 2020
project: STC-2148-18709	borehole: BH3
location:	date received: 2 December 2020
test procedure: AS 4133.1.1.1 and 4133.4.2.1	page 1 of 1
test apparatus: Avery with 200 kN CAS load cell 4222	

All samples were tested in an "As Received" condition.

Top platen 228 mm, Bottom platen 75 mm

QESTLab work order ID	height	uniaxial compressive strength	wet density	sample description	Client's Sample ID
depth	average diameter	MPa	moisture content	bedding/foliation	failure mechanism
QESTLab sample ID	test duration	height/dia ratio			
SYDS20W00078 6.00 to 6.21 m	9 Dec 20	147 mm	2.4 t/m ³	Sandstone	
SYDS20S00541	12.23 min	51.9 mm	5.4 %	Bedding planes are at an angle of 70° to the axis of loading	Shear
SYDS20W00078 15.03 to 15.22 m	9 Dec 20	150 mm	2.4 t/m ³	Sandstone	
SYDS20S00542	6.55 min	51.9 mm	6.3 %	Bedding planes are at an angle of 80° to the axis of loading	Shear
SYDS20W00078 19.00 to 19.20 m	9 Dec 20	152 mm	2.3 t/m ³	Sandstone	
SYDS20S00543	5.38 min	51.8 mm	8.2 %	Bedding planes are at an angle of 65° to the axis of loading	Shear
SYDS20W00078 25.11 to 25.30 m	9 Dec 20	149 mm	2.4 t/m ³	Sandstone	
SYDS20S00544	9.06 min	51.9 mm	7.7 %	Bedding planes are at an angle of 70° to the axis of loading	Shear



\\C:\fs\zct\Sydney\Data\50. ROCK TESTING_TESTSYD-Rocks\TESTSYDS00055AA - STC-2148-18709\BH3 UCS.xlsm]Report



Accredited for compliance with ISO/IEC 17025 - Testing
The results of the tests, calibrations, and/or measurements included in this document are traceable to Australian/national standards.

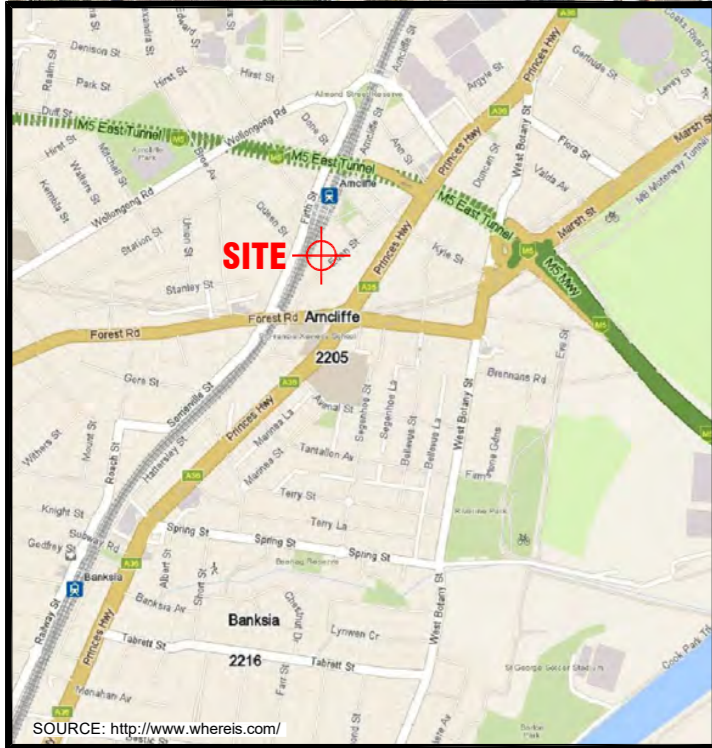
NATA Accredited Laboratory
No. 431
Authorised Signature:
Alan Cocks
Rock Testing Manager

Date: 11 Dec 2020



SYDS_001R

Appendix IV – Geotechnical Sections



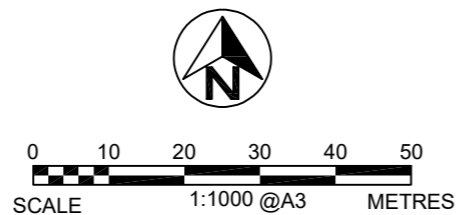
LEGEND

- BH BORE HOLE / MONITORING WELL
- APPROXIMATE SITE BOUNDARY
- SECTION LINE

NOTE:
ALL LOCATIONS ARE APPROXIMATE
DIMENSIONS IN METRES.

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM, 07 DEC 2020.

no.	description	drawn	approved	date
A	FIRST ISSUE	MC	JP	14/01/21

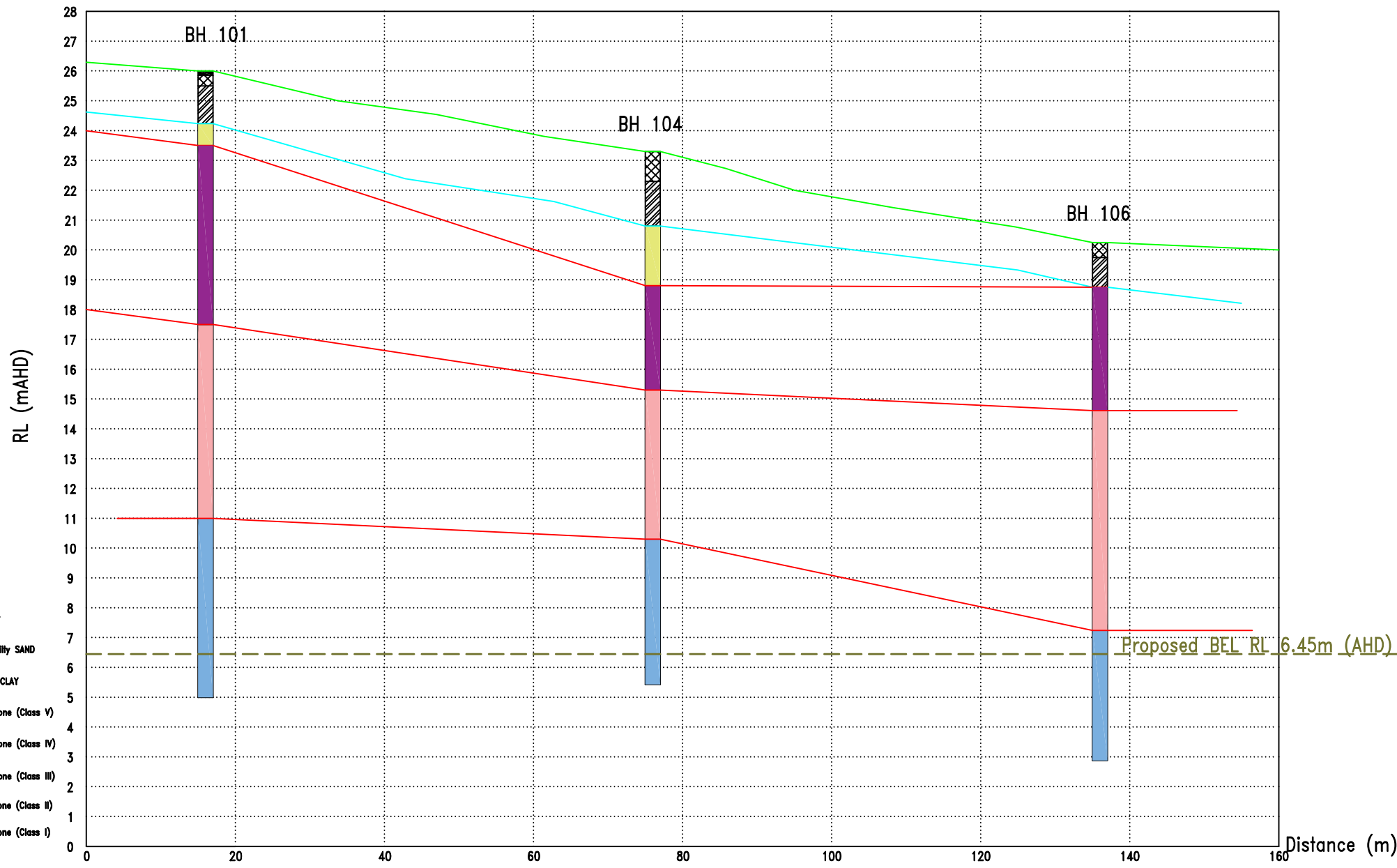


drawn	MC	client:	BILLBERGIA PTY LTD		
approved	JP	project:	ARNCLIFFE SITE-SOIL PROFILE 31 EDEN STREET, ARNCLIFFE, NSW		
date	14/01/2021	title:	SITE-PLAN		
scale	SCALE	project no:	STC-2148-18709	figure no:	1
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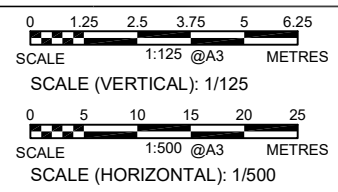


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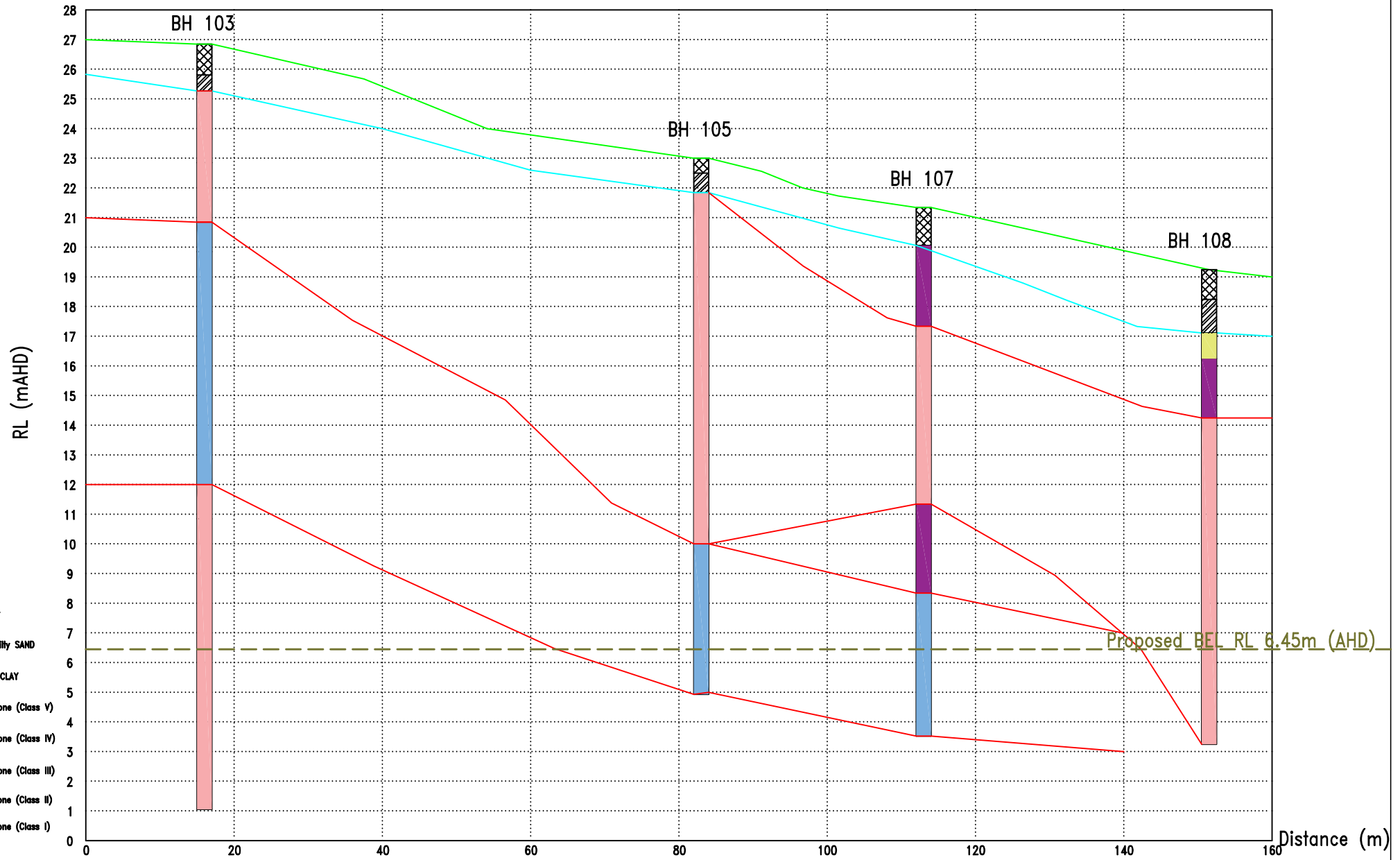
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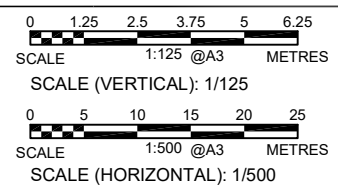
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date	14/01/2021	title:	SECTION-A-A'	
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original size	A3	rev:	0	

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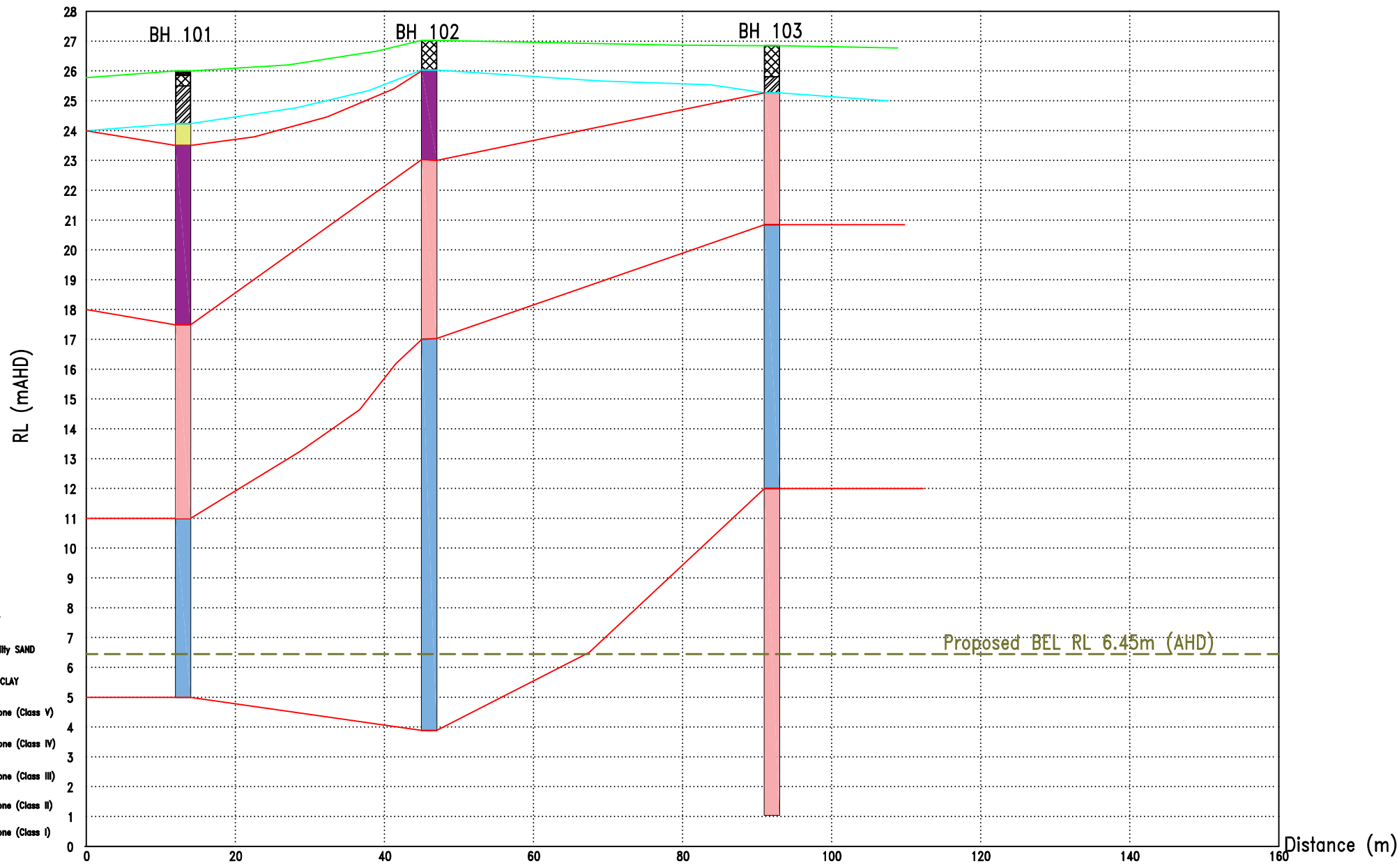
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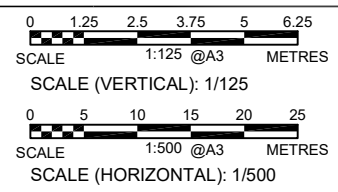
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date	14/01/2021	title:	SECTION: B-B'	
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original size	A3	rev:	0	

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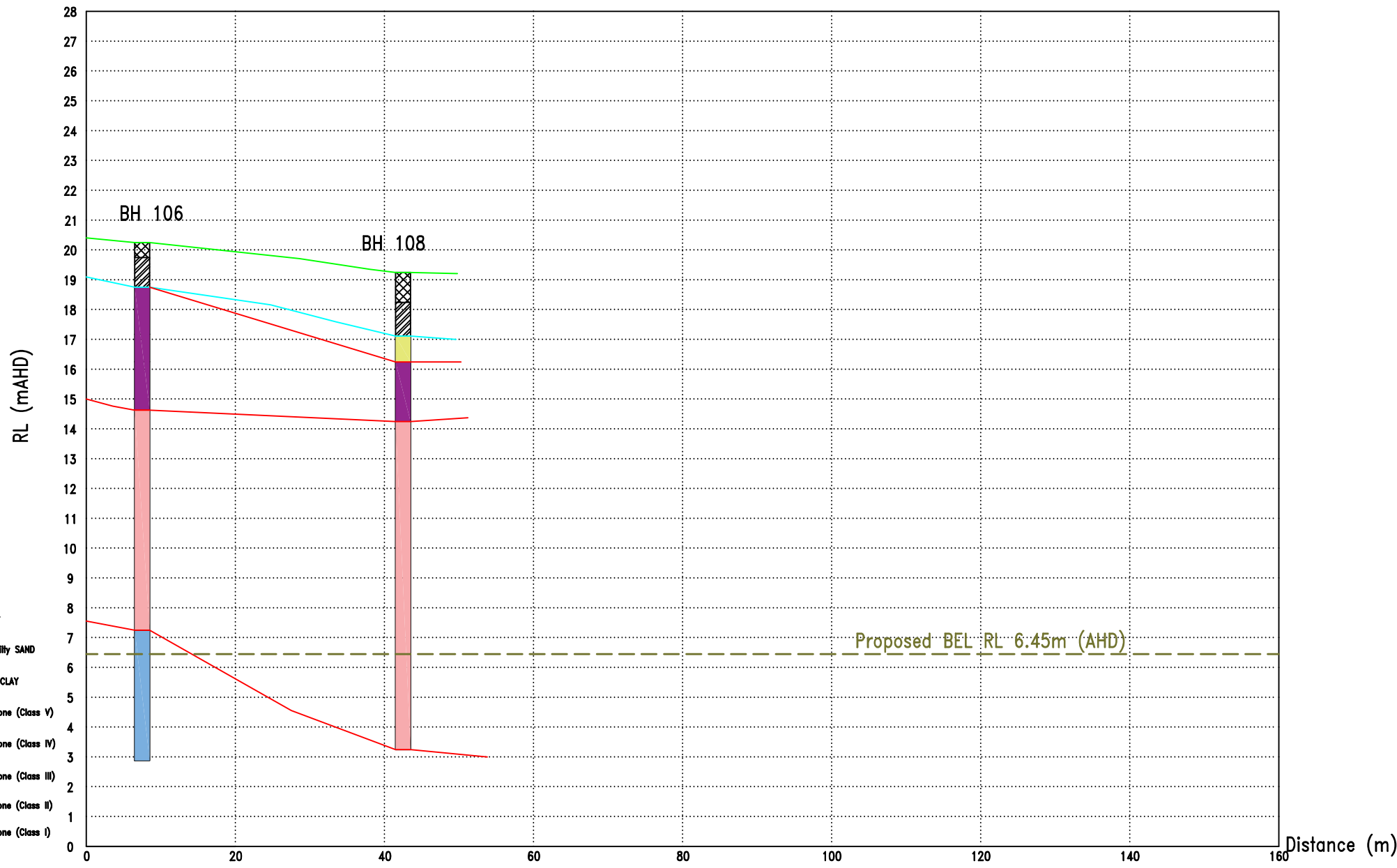
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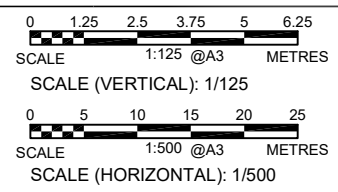
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date	14/01/2021	title:	SECTION:C-C'		
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no.	description	drawn	approved	date
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drawn	BB	client:	BILLBERGIA PTY LTD		
approved	JP	project:	ARNCLIFFE SITE-SOIL PROFILE 31 EDEN STREET, ARNCLIFFE, NSW		
date	14/01/2021	title:	SECTION:D-D'		
scale	SCALE	project no:	STC-2148-18709	figure no:	5
original size	A3	rev:	0		

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